ALASKA RETIREMENT MANAGEMENT BOARD

JUNE 17-18, 2021

BOARD OF TRUSTEES MEETING

TELECONFERENCE: 1-907-202-7104
JUNE 17TH ACCESS CODE: 373 009 925#
JUNE 18TH ACCESS CODE: 686 023 600#

THURSDAY, JUNE 17, 2021

I. 9:00 am Call to Order

II. Roll Call

III. Public Meeting Notice

IV. Approval of Agenda

V. Public/Member Participation, Communications, and Appearances

(Three Minute Limit)

VI. Approval of Minutes – March 18-19, 2021

VII. 9:15 am Staff Reports

A. Retirement & Benefits Division Report

- 1. Buck Consulting Invoices
- 2. Member Statistics
- 3. Legislative Summary

Ajay Desai, Director, Division of Retirement & Benefits Kevin Worley, Chief Finance Officer, Division of Retirement & Benefits

B. Treasury Division Report

Pamela Leary, Director, Division of Treasury

- C. Liaison Report
 - 1. Disclosures Report
 - 2. Communication Report
 - 3. Meeting Calendar

Alysia Jones, ARMB Liaison

D. CIO Report

Zachary Hanna, Chief Investment Officer

E. Fund Financial Presentation

Kayla Wisner, State Comptroller Kevin Worley, Chief Finance Officer, Division of Retirement & Benefits

VIII. 9:45 am Trustee & Legal Reports

A. Chair Report, Rob Johnson

B. Committee Reports

- 1. Audit Committee, Gayle Harbo, Chair
- 2. DC Plan Committee, Bob Williams, Chair

- 3. Actuarial Committee, Allen Hippler, Chair
- 4. Alaska Retiree Health Plan Advisory Board, Lorne Bretz, ARMB Member
- C. Legal Report, Benjamin Hofmeister, ARMB Legal Counsel

10:20 – 10:50 **D.** Actuarial Review/ Acceptance – Certification of FY 2020 Review Reports & Valuations

Allen Hippler, Chair, Actuarial Committee

Action: Board Acceptance of GRS Certification for

FY2020 PERS, TRS, NGNMRS, JRS, and DC Plan Valuations

Action: Board Acceptance of FY 2020 Buck Valuations for

PERS, TRS, NGNMRS, JRS, and DC Plan Valuations

BREAK @ 10:50 am (10 MINUTES)

IX. 11:00 am Presentations

11:00 – 12:00 A. Performance Measurement – 1st Quarter

Callan LLC

Paul Erlendson, Senior Vice President Steve Center, Senior Vice President

LUNCH @ 12:00 pm (75 MINUTES)

1:15 – 1:55 **B.** Private Equity, with Educational Discussion of SPACs

Pathway Capital Management Jim Chambliss, Managing Director Canyon Lew, Managing Director Wyatt Geiger, Senior Vice President

1:55 – 2:35 C. The Fed's Not Concerned About Inflation. Should You Be?

Callan LLC

Jay Kloepfer, Executive Vice President and Director, Capital Market Research

2:35 – 3:05 **D.** Using Futures for Rebalancing and Liquidity

Mark Moon, State Investment Officer

Action: Resolution 2021-03 Futures Guidelines

BREAK @ 3:05 pm (10 MINUTES)

3:15 – 4:15 **E. Executive Session**

FRIDAY, JUNE 18, 2021

9:00 - 9:50

F. International Equity, with Educational Discussion of Big Data

Arrowstreet

Alex Ogan, Partner, Portfolio Manager Jon Simon, Client Relationship Manager

9:50 – 10:30 G. Fidelity Tactical Bond

Jeffrey Moore, Portfolio Manager Michael Plage, Portfolio Manager

Beau Coash, Institutional Portfolio Manager

Kristin Shofner, Senior Vice President, Business Development

10:30 – 11:00 H. Fidelity Real Estate High Income

Stephen Rosen, Portfolio Manager William Maclay, Portfolio Manager Andrew Rubin, Institutional Portfolio Manager Kristin Shofner, Senior Vice President, Business Development

BREAK @ 11:00 am (10 MINUTES)

11:10 – 11:40 I. ARMB 2021 Asset Allocation Strategy – Callan LLC

Jay Kloepfer, Executive Vice President and Director, Capital Market Research

11:40 – 12:10 J. Asset Allocation Discussion and Action Items

Zachary Hanna, Chief Investment Officer

Action: Resolution 2021-01 Asset Allocation for the Public Employees' Retirement System Defined Benefit and Defined Contribution Plans, Teacher's Retirement System Defined Benefit and Defined Contribution Plans, and Judicial Retirement System Defined Benefit Plans

Action: Resolution 2021-02 Asset Allocation for the Alaska National Guard and Naval Militia Retirement Systems (NGNMRS)

X. Unfinished Business

XI. New Business

XII. Other Matters to Properly Come Before the Board

XIII. Public/Member Comments

XIV. Investment Advisory Council Comments

XV. Trustee Comments
XVI. Future Agenda Items

XVII. Adjournment

NOTE: Times are approximate, every attempt will be made to stay on schedule; however, adjustments may be made.

State of Alaska ALASKA RETIREMENT MANAGEMENT BOARD MEETING

Videoconference

MINUTES OF March 18 - 19, 2021

Thursday, March 18, 2021

CALL TO ORDER

CHAIR ROBERT JOHNSON called the videoconference of the Alaska Retirement Management Board (ARMB) to order at 9:00 a.m.

ROLL CALL

Seven ARMB trustees were present at roll call to form a quorum.

Board Members Present

Lorne Bretz
Gayle Harbo, *Secretary*Allen Hippler
Donald Krohn
Commissioner Lucinda Mahoney
Dennis Moen
Bob Williams, *Vice-Chair* (Late)
Robert Johnson, *Chair*

Board Members Absent

Commissioner Kelly Tshibaka

Investment Advisory Council Members Present

Dr. William Jennings Dr. Jerrold Mitchell Ruth Ryerson

Department of Revenue Staff Present

Zachary Hanna, Chief Investment Officer Pamela Leary, Director, Treasury Division Mike Barnhill, Deputy Commissioner Kayla Wisner, State Comptroller Scott Jones, Head of Investment Operations, Performance & Analytics

Michelle Prebula, Public Equity & DC Investment Officer

Sean Howard, Portfolio Manager Alternatives

Steve Sikes, State Investment Officer

Shane Carson, State Investment Officer

Casey Colton, State Investment Officer

Victor Djalalie, State Investment Officer

Mark Moon, State Investment Officer

Benjamin Garrett, Assistant Investment Officer

Sam Hobbs, Accountant IV

Ryan Kauzlarich, Accountant V

Tina Martin, Accountant IV

Hunter Romberg, Investment Data Analyst

Brian Fechter, administrative Services Director, OMB

Grant Ficek, Business Analyst

Alysia Jones, Board Liaison

Department of Administration Staff Present

Ajay Desai, Director, Division of Retirement & Benefits Kevin Worley, Chief Financial Officer, Division of Retirement & Benefits James Puckett, Deputy Director, Division of Retirement & Benefits

ARMB Legal Counsel Present:

Stuart Goering, AAG, Department of Law Rob Schmidt, AAG, Department of Law

Consultants, Invited Participants, and Others Present

Paul Erlendson, Callan LLC

Steve Center, Callan LLC

Jay Kloepfer, Callan LLC

Adam Lozinski, Callan

David Kershner, Buck

Scott Young, Buck

Ric Ford, Buck

Paul Wood, Gabriel Roeder Smith

Bill Detweiler, Gabriel Roeder Smith

Cathy Pena, Fidelity

Kristin Shofner, Fidelity

Gerard Callahan, Baillie Gifford

Eoin Anderson, Baillie Gifford

Michael Bowman, Capital Group

Steve Caruthers, Capital Group

Gerald Du Manoir, Capital Group

Kent Chan, Capital Group

Kelly McKale, Capital Group

Durrell Brown, Capital Group Alisa Oppliger, Crestline Keith Williams, Crestline Frank Jordan, Crestline Michael Kelly, PineBridge Deanne Nezas, PineBridge Doug Woodby, Public Dick Farnell, Public Jim Simard, Public Elaine Schroeder, Public Bob Schroeder, Public

PUBLIC MEETING NOTICE

Board Liaison MS. JONES confirmed that public meeting notice requirements had been met.

APPROVAL OF AGENDA

MS. HARBO moved to approve the agenda. COMMISSIONER MAHONEY seconded the motion.

With no objections, the agenda was approved.

APPROVAL OF MINUTES

MS. HARBO moved to approve the minutes of the December 3-4, 2020 meeting of the ARM Board. COMMISSIONER MAHONEY seconded the motion.

With no objections, the minutes were approved.

PUBLIC/MEMBER PARTICIPATION, COMMUNICATIONS AND APPEARANCES

MR. DOUG WOODBY said that he was a board member of 350 Juneau and a PERS beneficiary. He complimented CHAIR JOHNSON on the presentation he gave to the Retired Public Employees of Alaska on the history of the pension funds. MR. WOODBY stated that the fossil fuel industry was going through a reckoning with approximately \$20 trillion worth of carbon assets in the ground that were destined to become stranded. He requested the Board take an objective look at the decline in the energy sector and to respond prudently.

MR. DICK FARNELL said that he too was with the 350 Juneau Climate Action for Alaska and a PERS recipient. He shared a list of recent news articles with the Board that he found that related to the difficulties in the fossil fuel industry and how it was affecting the financial industry, drilling, lawsuits over climate change, actions by oil companies, climate risk assessment, and the automobile industry.

MR. JIM SIMARD said that he was also a board member of 350 Juneau. He reminded the Board of

his discussion with them about the risks to retirement fund investments posed by the climate-related litigation against the fossil fuel industry. He noted a second wave of cases being brought by municipalities that were gaining traction in the state courts. He said there was a significant case of BP versus the mayor and the city counsel of Baltimore that would be ripe for a decision in the spring and would have a large impact on that litigation.

MR. SIMARD stated the there was a growing number of climate related human rights cases, and one case involved five U.S. Indian tribes from Louisiana and Alaska that filed a complaint to the United Nations alleging the U.S. government had violated their human rights in failing to address climate displacement.

MS. ELAINE SCHROEDER also spoke of the recent decline in the profitability of the fossil fuel industry. She stated that pension funds globally were divesting from fossil fuels for fiduciary reasons and encouraged the ARM Board to no longer rely on the historical performance of fossil fuel to guide investments.

MR. BOB SCHRODER stated that he too was a member of 350 Juneau and a recipient of a State of Alaska pension. He said the continued concern for investments in fossil fuel would decrease the ARM Board returns and would result in less funding for Alaska pension holders.

CHAIR JOHNSON thanked the speakers for their testimony.

STAFF REPORTS

A. RETIREMENT & BENEFITS DIVISION REPORT

1. Membership Statistics

MR. WORLEY referred to a summary for PERS membership stating that active members in Tiers 1 through 3 decreased by 183, DCR membership increased by 597 for a net increase of just over 400. He said TRS Defined Benefit TIERS 1 and 2 increased by 11 and Defined Contribution retirement system TRS increase by 381. He said retirees in PERS increased by almost 100 and there was a slight decrease in TRS retirees.

2. Buck Invoices

MR. WORLEY referred to a summary of monthly billings with Buck that included quarterly subtotals for September and December, and a summary total for six months.

3. Legislative Update

MR. PUCKETT said there had been a handful of bills that they had tracked during the session. He said HB55, peace officer/firefighter retiree benefits, HB18 which was in regards to teachers' national certification, HB19, also related to teacher certification, HB75 and companion bill SB55 which relate to employer contributions to PERS, SB6 which dealt with retirement incentive programs, SB30 regarding colorectal cancer screen coverage and SB37 which would allow former PERS and teachers the opportunity to choose to go back into the Defined Benefit.

B. TREASURY DIVISION REPORT

MS. LEARY said the Fiscal Year 2022 budget the ARM Board adopted in September was making its way through the Legislature and was completely intact. She said she would give an update on it at the June meeting.

MS. LEARY said that 95 percent of the staff were continuing to telework, however more people were coming into the office for a day or two a week to work.

C. LIAISON REPORT

1. Disclosures Report

MS. JONES said that no disclosure transactions required additional review or discussion.

2. Communication Report

MS. JONES said the report showed the communications received that were directed toward the Trustees as well as public records requests.

3. Remaining 2021 & Draft 2022 ARMB Meeting Schedule

MS. JONES directed the Board to the 2021 and 2022 meeting calendars and said staff did not think the April 29th Actuarial Committee or April 30th Board of Trustees meetings were necessary. There were no objections to cancelation of those meetings from board members. MS. JONES also asked about location preferences of future meetings. CHAIR JOHNSON suggested MS. JONES work with staff to determine location and logistics for the June meeting and keep the Board informed.

D. CIO REPORT

MR. HANNA gave an update on the market activity since the December meeting. He said the stimulus and liquidity continued to drive markets upward and the ARM Board assets were at an all-time high of almost \$40 billion across DB and DC assets. He also touched on topics that would be discussed later in the meeting.

MR. HANNA said that currently, there were no investment managers on the watchlist, but staff was recommending that the Man Group alternative risk premia strategy be placed on the manager watch list due to turnover of key personnel. He said that staff should have the watch list action resolved in 12 to 18 months. He asked the Board to consider making a motion to place the Man Group on the manager watch list.

MS. HARBO moved to place the Man Group on the manager watch list. COMMISSIONER MAHONEY seconded the motion.

A roll call vote was taken, and the motions passed unanimously.

MR. HANNA said that items in 3 were areas in which he exercised CIO delegation for contracting.

He said item 4 was a summary of the portfolio rebalancing that took place between November and February. He noted that fixed income trades were split between cash, bonds, and Fidelity's tactical bond portfolio.

MR. HANNA indicated that staff was comfortable with fixed income risk profile on balance with roughly \$4.7 billion in lower risk bonds. He said they had also invested \$167 million in opportunistic, split between Fidelity and PineBridge. He said they increased the internally developed multifactor strategy by \$100 million and had also conducted five internal rebalance transactions to equalize relative allocations across the plans they manage.

E. FUND FINANCIAL PRESENTATION

MS. WISNER said PERS invested assets were \$21 billion, TRS assets were \$10 billion, JRS had total invested assets of \$265 million, and NGNMRS had total invested assets of \$487 million. She said in total, nonparticipant-directed plans had invested assets of \$31 billion. She said year-to-date investment income for nonparticipant-directed funds was \$5.3 billion, year-to-date withdrawals were \$549 million, and there were \$15.5 billion of invested assets under internal management.

MR. WORLEY directed Board members to page 100 for the financial information. He said had highlighted the big items for the Board on pages 103 and 104, including average numbers collected as well as any significant activity for a month.

MR. WORLEY explained \$33 million was paid out in PERS and \$31 million of it is 100 percent vested folks. MS. HARBO asked for additional clarification regarding the 88% of DC distribution going to people who were 100% vested. MR. WORLEY said he would work with Empower to see what additional information was available and follow up through MS. JONES.

TRUSTEE & LEGAL REPORTS

A. CHAIR REPORT

CHAIR JOHNSON said that he enjoyed his discussion with new Trustee DON KROHN and stated that he thought they would enjoy working with him. He also said he would like to thank MICHAEL COLLINS for his brief participation on the ARM Board. MR. COLLINS discovered a conflict with his employment and had to step down.

B. COMMITTEE REPORTS

1. Audit Committee

MS. HARBO reported that five audits were remaining for FY2019. They have completed 14 out of 59 audits for FY2020, and the remainder have moved to FY2021. She said there were several large employers who still needed to be audited. They audit all employers once every four years on a rotating basis.

MS. HARBO said that there had been a problem with PERS people going from retired to rehired

which they were working through.

MS. HARBO said that MR. WORLEY reported that there were eight GASB schedules sent out to employers - two for GASB for the DB pensions for PERS and TRS, and six for the GASB 75. She explained that the schedules were used by employers for their financial reporting at the end of their year. She mentioned that the CAFR that MR. WORLEY spoke of was full of information on the retirement systems and that it was accessible to everyone. She said MR. MCKNIGHT gave an informative compliance report, and they heard a report by MS. WISNER regarding the importance of internal audits.

2. Actuarial Committee

MR. HIPPLER reported that they had an informative presentation from Buck about a sensitivity analysis that showed how the assets and liabilities of the plans could weather unexpected events. He said they conducted historical comparisons to help identify weaknesses and to assist in making decisions. He said they also discussed having the actuaries provide pre-recorded presentations, however no action was taken. He said the Actuarial Committee Charter was discussed but there were some legal issues that needed to be addressed. He said legal counsel made suggestions that were incorporated into the charter and would be brought to the ARM Board for adoption. He said they also reviewed the actuary audit contract. A discussion was held at the previous Committee meeting in December and it was determined that the third level actuary could be the same as the second level actuary. CHAIR JOHNSON suggested they move on those items the next day.

3. DC Plan Committee

MR. WILLIAMS reported that MR. PUCKETT gave an overview of the Blueprint Annuities portal which was still under construction. He said they had some annuities with Empower that were on hold until SmartSpend and the brokerage window go online. They are hoping for early July to get them up and running.

MR. WILLIAMS said that MR. TAYLOR from Callan reported on the Callan 2021 Defined Contribution survey. He said that this year they were going to focus on reduction of fees, plan leakage and how to contain it. He said MR. WORLEY and MS. WISNER discussed contribution fees, defined contribution fees, the HRA, and the BEARS (Benefits And Retirement System) upgrade. He said there was also an Empower update regarding fees and their quality of service. He said MR. HANNA and MS. PREBULA reported on Treasury updates and how they had used the same types of metrics to negotiate with the DB to do the same things with DC. He said they also reviewed a draft of the Defined Contribution Investment Policy Statement for inclusion in the ARMB Investment Policy and Procedures Manual, which would be discussed again at the June meeting.

4. Operations Committee

CHAIR JOHNSON reported that MR. JONES had spoken with the Vertex11 group, who was assisting with and assuring security. He said they also discussed whether or not there should be a limitation imposed on the size of the Actuarial Committee, however no motion was advanced, and it was inferred that they would continue the way they had been doing things. He said they had a request from MR. NILS ANDREASSEN from the Alaska Municipal League (AML) that MR. BRETZ, as the public finance officer member of the board, give regular reports, either orally or in writing, to the

AML. He said the committee decided that it would be inappropriate to have one board member speak as the ARM Board or on behalf of the ARM Board.

CHAIR JOHNSON advanced a motion on behalf of the committee to decline the invitation of AML to have a regularized presentation by MR. BRETZ to the AML, but also urge the AML to review Board records and participating in ARM Board meetings. Hearing no discussion, he requested MS. JONES to conduct a roll call vote.

A roll call vote was taken, and the motion passed unanimously.

5. Alaska Retiree Health Plan Advisory Board

MR. BRETZ said that he had provided a written report but wanted to highlight some of the information in it. He said they were considering the feasibility of some updates that would bring it in line with modern health plan offerings by looking at Medicare Advantage. He said the plan looks promising as an alternative optional retiree health plan.

C. LEGAL REPORT

MR. GOERING stated that he had nothing new to report on the three items of litigation he had been tracking. He did remind the Board that they were not a defendant in any of those actions and that it was unlikely the assets of the Board would be affected by the decisions in those cases.

MR. GOERING recommended the Board consider having a presentation on the historical context of the actuarial process found within their current statutes as a future agenda item. In response to CHAIR JOHNSON'S question at the DC Plan Committee meeting regarding regulations pertaining to the brokerage window, he said that, at this time, the Board did not need to adopt regulations.

CHAIR JOHNSON recessed the meeting from 10:46 a.m. until 10:52 a.m.

PRESENTATIONS

A. Buck Update, Draft June 30, 2020 Actuarial Reports & Experience Study Timeline

MR. KERSHNER noted that their materials started on page 108 of the packet. He explained that the data he was presenting was data and assets that existed at the beginning of the fiscal year of June 30, 2020 and were used to set the contribution rates for FY2023, which helped in the budgeting process. He explained that the current year contributions were based on the June 30, 2018 valuation.

MR. KERSHNER said gains in pension were mainly due to inflation for the year ending June 30, 2020 at about 1.3 percent and the long-term inflation assumption was 2.5 percent. He said that since inflation did not increase as expected, salaries as well as PRPA's and COLA's did not go up as much as expected. He said the main source for healthcare gains was the medical and prescription drug claims paid out during the last year did not increase as much as expected. He said the lower unfunded liabilities only reflected the actuarial smoothed asset losses and not the full market asset losses incurred in FY2020. He said the current estimates of additional state contributions, which is the amount the state pays over and above the capped employer contributions of 22 percent of pay for

PERS and 12.56 percent of pay for TRS are \$196 million for PERS, and \$146 million for TRS for FY2023. He said the estimates for FY2023 for PERS and TRS would be refined to reflect the FY2021 asset experience and then the FY2023 amounts would be set in September of this year.

MR. FORD explained that they used asset volatility and smoothed it over a five-year period which moved the starting point for actuarial losses on the asset side to negative \$275 million. He said they used the same procedure for liabilities where they compared how many people died versus what was expected, and what the pay was versus what was expected. He said on the pension side payroll did not go up as much due to inflation being lower and because the benefit was based on the final average pay and the pay did not increase as much as expected, so it would be a lower benefit which meant a liability gain. He said that on the healthcare side due to the new prescription drug contract, there was a \$441 million gain. He explained that the negative \$275 million plus the \$441 million made for a total negative impact on the unfunded liability, bringing it down\$166 million. MR. FORD said that for TRS, the unfunded liability went down by \$15 million.

MR. YOUNG explained that the primary driver for the actuarial gain on the healthcare side was the new prescription drug contract. CHAIR JOHNSON asked MR. YOUNG if the beneficiaries were appealing the decision regarding the new drug contract because they were unhappy that they had to use generic medications when they were satisfied with the name brand -- could there be a one-year or two-year lag in the final determination; MR. YOUNG said that he did not think that was an issue because the new deal did not change the plan, they still pay the same amount and get the same drugs. He said the negotiated prices with the manufacturers and pharmacy benefit managers were more favorable than the old plan.

MR. YOUNG said that Slide 10 showed another way to visualize the liability. He said as of the June 30, 2020 valuation showed the liability for the PERS DB Plan of \$7 billion. He said the chart also shows the breakdown of the pre-65 people, the post-65 people, and prescription and medical costs. He also explained the Medicare portion was higher than the pre-Medicare portion because over twice as many members were Medicare eligible. He said another reason the Medicare liability was higher was that members spend more of their retirement years in the Medicare system.

MR. KERSHNER said that it was almost time for the next four-year experience study. He said the assumptions were tweaked to the point that they believed the most recent experience suggested that the future experience may be different than the assumptions set four years prior. He said the expected return on assets was set in 2019 at 7.38 percent. He said based on changes in the investment outlook for equities, fixed income securities, and lower inflation expectations, they anticipated that investment returns would come down.

B. GRS Draft Actuary Certification

MR. WOOD said that overall, they found Buck's development of and adjustment to the per capitas to be reasonable.

MR. WOOD noted that after reviewing two full years of experience out of the most recently adopted assumptions, they were seeing trends developing in the Medicare Part B assumption that caused consistent gains. He said it was to be expected as this assumption was set on the more conservative

side. He also noted that there might be pressure on the discount rate to come down from 7.38 percent as the median discount rate is 7.23, according to a survey of peers released by the National Associate of State Retirement Administrators (NASRA).

MR. WOOD stated in the past they had not been able to certify the relative value assumption that was built into the valuation to account for the difference in plan design of DC and DB plans was reasonable. He said that MR. YOUNG provided background information to GRS on how they developed the factors. They then worked with their internal healthcare team at GRS and used the same assumptions and verified that they were reasonable.

MR. WOOD said they removed the .2 percent trend adjustment that had been built into the DCR plans to maintain a certain cost sharing arrangement when they thought the plan design would change on an annual basis. Buck followed their recommendation to remove it, since those adjustments have not happened annually.

MR. WOOD moved on to the test lives review explaining they looked at data inputs and compared what was used in the valuation to the raw data. He said they looked at benefit amounts and the liability calculations. He said the sample lives tell them if the assumptions are being used correctly and also provide insight on the accuracy of the value of the plan provisions. He also noted that the findings had no bearing on the way the benefits were administered, that it was the way they were being modeled as part of the valuation where they suggest improvements.

COMMISSIONER MAHONEY asked what the percentage of the total in regard to the sample size was; MR. WOOD stated that it was 15 to 20 test lives and that they focused on the main benefits that drive the overall costs to the plan. He also said that each year they find new test lives with unique characteristics.

MR. DETWEILER discussed the five findings that were found and noted all five were considered to be minor findings. He said the first finding related to the 10 percent Alaska COLA for benefit recipients who reside in Alaska and should be paid immediately to all disabled members. He said they had discovered that Buck was not applying them immediately for certain TRS members, instead they were deferring the 10 percent COLA until the members reach 65. They recommended that this COLA be applied for all disabled members immediately.

MR. DETWEILER said the second finding was for the peace officer/firefighter members who had occupational disability. He said they discovered Buck was applying the PRPA increase for members in the DCR plans only. They recommended they apply the PRPA increase in the DB plans as well.

MR. DETWEILER said the third finding was related to the decrements Buck uses. He said they discovered a specific decrement that did not match what they listed in their report the prior year and what had been available at the time of the test life reviews. They recommended Buck fix that specific rate and check all other rates used for consistency between their reports and what they were valuing in their models.

MR. DETWEILER said finding four was related to early retirement factors. He said they noticed

Buck's report did not specify what the assumptions were, and they were unable to tie the ERF's that were being applied to the current assumption in the report. He said Buck provided additional clarification and GRS' recommendation is that they disclose the exact assumptions being used in their reports.

MR. DETWEILER said finding five concerned the National Guard Plan. He said most members receive the \$1,200 standard annual benefit or \$100 a month. He said when Buck valued death benefits that may be paid for current retirees, they valued \$1,200 for everyone, including those that receive an amount other than \$1,200. He said they recommend that Buck make updates to ensure that the death amounts are consistent with the amount the retiree is receiving.

MR. DETWEILER provided a summary of their recommendations and indicated that they would be comfortable with the Board accepting the reports as presented in the meeting packet and waiting until the next valuation to see the updates.

CHAIR JOHNSON recessed the meeting from 11:53 a.m. until 1:01 p.m.

C. 57 Years of Investing: Some Observations

DR. MITCHELL stated that he had given a brief talk in 2014 to the Trustees of the Alaska Permanent Fund Corporation that he called "50 Years of Investing -- Some Observations" and that seven years later, those ten observations seemed to be just as valid. The first one was to own the U. S. stock market, diversification is good, but it is not free. His second observation was investment management was a business and all investment managers are salesmen. He said the most successful investment managers are much richer than their clients. His third observation was that economic forecasting was inaccurate. His fourth observation was market insights were temporary and self-correcting. He said buy early into a hot stock or asset class. His fifth observation was that high risk does not mean high return. His sixth observation was that past performance is not a guarantee of future results. His seventh observation was to have realistic return assumptions. His eighth observation was investment theories and investment models do not always work in the real world. His ninth observation was doing nothing was sometimes better than doing something. He said most successful investors change very little, they buy and hold, and hold and hold. His tenth observation was that the smartest person is not always a successful investor.

D. Performance Measurement - 4th Quarter

MR. ERLENDSON welcomed the new trustees and explained what Callan does for the ARM Board. He said they had four functions which consisted of measuring and evaluating performance results, assisting staff and the Board with establishing the strategic asset allocation target, providing assistance to the staff when there was a need for a new or replacement investment manager, and education. He stated that Callan would be holding an in-person client conference in Salt Lake City from July 19th to July 21st, that will also be available on the Internet for remote attendance.

MR. ERLENDSON then moved to Slide 2 which was an overview of the U.S. economy as of December 31st. He stated that it had been an incredibly volatile year, but that at year end, the economy had grown at a rate of 4.1 percent, despite the nearly 30 percent decline in the second quarter. He noted that the producer price index (PPI) was increasing which meant there was the possibility of

inflation. He also noted that the first quarter performance showed 30-year Treasuries ended the year yielding 1.7 percent and as of March 17th, 30-year Treasuries were yielding 2.4 percent. He pointed out that for 90-day Treasuries and 30-day Treasuries, the rates had remained very stable, being close to zero, so the difference between the short and long rated had gotten steep which indicated that there was an expectation of higher growth going forward.

MR. ERLENDSON stated that in terms of unemployment, the rate had dropped from 14.7 percent in April to 6.7 percent at the end of November, but there was still 10 million people unemployed. He said there were still significant areas where industries, opportunities, and living conditions had not recovered. He mentioned that although China's GDP had fallen significantly, and were the first ones hit by the pandemic, they bounced back to be one of the best performing economies in the world.

MR. ERLENDSON said for the U.S. stock market, online retail was up 69 percent for the year, where the airline industry was down 31 percent. He said the largest contributor to the U.S. economy was the government sector, where technology only contributed 6 percent of the U.S. GDP.

MR. ERLENDSON said that in April of last year 6 million people filed for unemployment benefits as things were beginning to shut down and people were being laid off. He said this caused the Feds to start lowering rates and began buying up to \$80 billion a month in Treasury bonds and buying \$40 billion a month in mortgages. He said the Federal Open Market Committee of the Federal Reserve had met recently and agreed to continue to provide economic stimulus by buying bonds, support the bond market, and hold interest rates at the level they currently were.

MR. ERLENDSON said that as people received their stimulus checks, there was an uptick in the amount of people saving their money - a lot of savings went into the money market and mutual funds. He said that shortly after that, they started to spend money again.

MR. ERLENDSON noted that as the economy lost its footing, small cap stocks lost significantly for three consecutive months, however, even though it looked as if small caps where something to avoid, they were actually the best place to be. He said that the take-aways from his presentation were that (1) economic growth was looking to be positive for the year as recovery continues from the pandemic; (2) there was a slight uptick in interest rates,; (3) inflation was on the horizon, but should not get out of hand as there is a lot of capacity for growth without inflation, and (4) equity markets have started to come back into balance. He noted that large cap stocks year-to-date were up by about 6 percent and small cap stocks were up over 18 percent year-to-date. He also pointed out the difference between growth and value stocks. He said last year growth stocks were up 38 percent and value stocks were up 3 percent. He said normally, the distance between the two was 1 or 2 percentage points in a calendar year, but last year it was at 35 percent. He said this year growth stocks were up less than 2 percent and value stocks were up 13 percent, so the tables were turning.

MR. CENTER reviewed the performance dashboards for the pension plans, healthcare plans, and military plans over the last 10 years. He said the returns relative to peers and the benchmarks had been above median and ahead of the benchmark over the 10-year period and realized standard deviation had been below median relative to peers over all time periods. He said the maximum drawdown was

less than peers had experienced over the same time period and the Sharpe Ratio compared favorably relative to peers and benchmarks. He noted that the healthcare plans had a similar pattern of strong performance, strong risk-adjusted returns, and drawdowns that compared favorable versus peers and benchmark. He pointed out that the military plan had historically different asset allocations than PERS, TRS and the judicial plan, but had migrated towards the same allocation. He stated the military plan had been invested in a more conservative manner. He said the biggest loss experienced over the time period compared favorably relative to peers.

MR. CENTER said the PERS plan was very close to target asset allocation at the end of 2020. He said the PERS plan had a slightly higher allocation to real assets and alternatives than other public plans, median allocation to domestic equity, and a slightly lower allocation to fixed income than other public plans. He said performance for the PERS plan was above median over all time periods which reflected the PERS plan's prior allocation that had a higher allocation to growth prior to two years ago, before the fixed income allocation was dialed in slightly.

MR. CENTER pointed out that the PERS plan had a negative return of 11.9 percent earlier in 2020 as the market had its own shakeup. However, the drawdown experienced by the PERS plan ranked above median, with less of a drawdown than other public funds had during that same period. He stated the long-term performance for the PERS plan was relative to both its benchmark and actuarial expected return. He said overall, the plan performed in line with its target benchmark.

MR. CENTER stated that PERS and TRS outperformed the policy benchmarks over the one quarter, one year, and three-year periods, slightly underperforming the benchmark from the last two years. He said that was due to the private equity program which had performed very well, up 13.5 percent and ahead of its benchmark return, fixed income and real estate also performed well. He said public equities and public domestic equity portfolios lagged its benchmark. He said private equity was a key driver of performance, up 16.6 percent last year and well ahead of its benchmark. He said Global ex-U.S. equities also performed well relative to their benchmark as did real assets. He noted that MR. HANNA and his team had kept the asset allocation close to the target and as a result, deviations from asset allocations rarely were drivers of the performance. He said key performance drivers were typically manager-relative performance.

MR. CENTER said both PERS and TRS had outperformed their long-term benchmarks by one-half percent and were well above the median. He said for the calendar year, PERS and TRS plans ranked above median in seven of the 10 years shown on the graph. He noted that during down market years the plans are performing quite well.

MR. CENTER explained that there was a drag on the relative performance for 2020. He said the domestic equity program returned 15.3 percent versus 20.9 percent for the Russell 3000 index. He said the key drivers to the lag in performance were the value overweight that was embedded within the Scientific Beta portfolio and the factor-driven strategy managed internally by the Department of Revenue. He said the way the small cap program was implemented through passive investment in the S&P Small Cap 600 strategy was also a factor.

MR. CENTER said Slide 40 was an illustration of portfolio characteristics for the domestic equity

portfolio. He said the domestic equity program had a slightly smaller capitalization bias relative to the benchmark, the Russell 3000. He said the Z-Score notated on the chart was a measurement of how much of a tilt towards growth-oriented stocks or value-oriented stocks the portfolio had. He noted that the first quarter of 2021 could be a banner quarter for the program as small cap stocks had done very well to date.

MR. CENTER said the large cap stocks performance relative to both peers and the benchmark was the biggest drag on the performance due to the performance of the Scientific Beta program.

MR. CENTER indicated that the ARM Board's global ex-U.S. equity program had outperformed the benchmark over time, slightly below median but ahead of both the MSCI EAFE and its target benchmark. He stated that the International Equity Ex Emerging Markets Strategies were ahead of the target benchmarks over all time periods. He said Arrowstreet performed well last year and was up 22.7 percent. He said Baillie Gifford, a growth-oriented non-U.S. strategy and Brandes a value-oriented strategy made up the international equity strategy within the Defined Contribution Plan and complimented each other very well.

MR. CENTER said the emerging market portfolio contained two portfolios, a passive allocation and an allocation to a factor-based emerging market equity strategy. He said it had underperformed over the last year by 3 percent, and that value outperforming growth was a trend that was happening outside the U.S. as well.

MR. CENTER said from a risk standpoint and implementation standpoint, the fixed income portfolio had done very well. He said 75 percent of it was internally managed in a U.S. aggregate portfolio and had outperformed its target benchmark by 65 basis points. He said the U.S. aggregate portfolio had a return of 9.1 percent during the last 12 months which was ahead of the U.S. aggregate that was up 7.5 percent. He said the portfolio was complemented with opportunistic fixed income strategies managed by Fidelity. He noted that other diversifying investments called alternative fixed income strategies were up 2.9 percent over the last 12 months and includes some specialty lending strategies. He said a couple of the strategies struggled, but that the Crestline portfolios, which make up a significant part of that portfolio performed very well.

MR. CENTER said the opportunistic portfolio which was a diversifier within the overall asset allocation was up 10.7 percent in 2020 and 8.4 percent the last quarter. He noted that it included an allocation to the McKinley Healthcare Transformation fund which was up 33.8 percent last year. He noted that 65 percent of the opportunistic pool was in tactical asset allocation strategies including PineBridge and Fidelity.

MR. CENTER noted that the alternative beta allocation to Man Group was designed to mimic the performance of a hedge fund without having to invest in nontransparent hedge funds and provides greater liquidity and transparency than investing directly in hedge funds. He said they struggled to add value in the near term.

MR. CENTER said the PERS Defined Contribution (DC) Plan ended the year with \$1.7 billion in assets and 60 percent of the portfolio was invested in the asset allocation funds with the remainder

evenly split between passive and active core options. He said the TRS DC Plan ended the year at \$709 million with 60 percent allocated to the asset allocation funds and the remaining split between active and passive core options. Both the PERS and TRS DC plans were cash flow positive. The Deferred Comp plan ended the year at \$1.1 billion evenly split between passive and active core with 20 percent assets invested in the target date funds and is slightly cash flow negative. The SBS funds also had 60 percent allocated to the asset allocation funds.

E. Fidelity Signaling Investment Review

MR. HANNA introduced KATY PENA and KRISTIN SHOFNER from Fidelity. He said that Fidelity runs a \$584 million multi-asset portfolio for the defined benefits systems.

MS. SHOFNER stated that she was with Fidelity Institutional Asset Management and introduced MS. PENA the signaling portfolio manager.

MS. PENA said they are working with staff to potentially shift the asset allocation from 60/40 to 70/30. She said over the long run interest rates should be around the same level as nominal GDP growth and pointed out the two larger contributors to GDP growth. She said the first contributor is population growth, and the more people that are of working age, the higher they anticipate the GDP would grow. She said productivity growth was the second contributor, and that to determine nominal growth, expectations of inflation must be added. She said that the U.S. had a total expected nominal GDP growth of 3.6 percent over the next 20 years and over time the 10-year interest rates should gravitate toward the 3.6 percent level. She said they were at 1.7 percent which indicated a potential for upside revisions to where yields could go in the future. She noted that financial repression, a monetary policy designed to keep rates below the equilibrium level and could actually hamper the rates from rising to the level needed over the next 10 to 20 years. She also noted that aging populations and reduced labor forces slows growth as well and the combination of these factors result in a low-yield environment, which then leads to a low expected return environment.

MS. PENA said that Slide 9 showed the 60/40 portfolio including the historical 10 year rolling returns of the 60 percent S&P, 40 percent Barclays Agg benchmark. She said they expect going forward that things will return to below 4 percent, but it had been a challenge for many investors. She said that clients had responded to that environment by taking a more active management risk, adding opportunistic income, shifting asset classes within equities, adding equities, and taking on leverage.

MS. PENA said they were considering increasing the equity allocation by 10 percent and include REITS, which was not currently in the mix of asset classes that could be used, and also small cap equities could be added on. She noted they currently had the Russell 2500 (mid cap equity), but not small caps in the portfolio. She said by making the changes they would see an increase in the expected 10-year return of the portfolio from 4 percent to 4.5 percent, but it would mean that the value at risk would be higher, the max drawdown would be higher, and the duration would go from 2.5 years to 1.9 years.

MS. PENA explained the Signaling mandate. She said asset class returns were influenced by where

they were in the business cycle (the ebb and flow of the economy), which was driven by changes in corporate profitability, inventory levels, and credit. She said the business cycle breaks down into four phases, which were early, mid, late, and recession. She said 2020 was unique because it went through each phase of the cycle in 12 months, which had never happened before. She explained that it was good to own more stocks during the early cycle because they are worth more. She said the mid cycle was the longest cycle, and that it was good to be "risk-on" though to a lesser degree. She said late cycle would be the time to be slow and steady, and in recession it was best to move to a defensive stance, since bonds outperform stocks during that phase.

MS. PENA explained how they respond to these cycles. She said that during the early cycle stocks would begin to wane and during mid cycle, they would begin to rise, so that transition period holds a unique opportunity in the market. With that in mind, they created cluster portfolios, to help smooth transitions from one cycle to another.

MS. PENA said that the risk tolerance of Alaska is not consistent with strong risk aversion, so the proposal was to take away the risk penalties in the process, and potentially increase return. She explained that they had been working on enhancing their historical returns in an effort to try to properly weigh the different returns. She said they also research different ways of looking at the potential overweight and underweight portfolio mixes with different types of market environments to ensure portfolio weights were resilient to different types of market environments.

MS. PENA noted that through January 31st the portfolio was ahead of the benchmark over most time periods. She also noted that the rolling one-year excess returns had picked up ground. She said that the global economies had synchronized, but over time will change a bit as they come out of COVID. She said they anticipate a lot of stimulus as well as potential for higher inflation and higher yields in the near term. She added that there is some inflation protection in the portfolio.

ACTION: Fidelity Signaling Portfolio

MR. HANNA recommended two changes to the portfolio. He said the first would be a shift from a 60/40 stocks/bonds risk target to a 70/30 risk target to align the risk of the portfolio with the risk of the overall ARM Board portfolio. He said the second recommendation was the addition of two new asset classes, small cap and REITS.

MR. HANNA said the overall staff recommendation was that the ARM Board authorize staff to make the necessary changes to the Fidelity Signaling investment guidelines to change the benchmark to 70/30 MSCI ACWI IMI and with Bloomberg Barclays Aggregate index and add REIT and small cap building blocks to the portfolio opportunity set.

MS. HARBO so moved. MR. BOB WILLIAMS seconded the motion.

A roll call vote was taken, and the action item passed unanimously.

CHAIR JOHNSON recessed the meeting from 3:00 p.m. until 3:10

F. Executive Session

CHAIR JOHNSON proposed the following motion to go into Executive Session to consider a matter related to a specific direct investment, the immediate knowledge of which would have an adverse effect on the finances of the public entity, and which also involve consideration of government records that, by law, are not subject to public disclosure. The documents are not subject to disclosure under a confidentiality agreement because the records contain information that could affect the value of investment by the Board or which could impair the ability of the Board to acquire, maintain, or dispose of certain investments.

MR. WILLIAMS so moved. COMMISSIONER MAHONEY seconded the motion.

A roll call vote was taken, and the motion passed unanimously.

CHAIR JOHNSON asked MR. HANNA who would be joining the Board in Executive Session. MR. HANNA responded that he would be in attendance along with the following staff: MS. LEARY, MS. WISNER, MR. SIKES, MS. JONES, and MR. GOERING.

CHAIR JOHNSON recessed the public session of the meeting at 3:20 p.m.

Friday, March 19, 2021

CALL BACK TO ORDER

CHAIR JOHNSON reconvened the meeting at 9:00 a.m.

CHAIR JOHNSON announced that the ARM Board came out of Executive Session yesterday at 4:14 p.m. No actions or decisions were taken by the Board.

G. Brexit and International Equities

MR. HANNA introduced EOIN ANDERSON of Baillie Gifford.

MR. ANDERSON said that he was the Client Services Director at Baillie Gifford and introduced GERARD CALLAHAN, Chair of the International All Cap Portfolio Construction Group and Head of the U.K. Equity Team. He explained that they manage international equity portfolios on behalf of the ARM Board.

MR. CALLAHAN said the U.K. left Brexit in January of 2020, but it had been in the works for almost 50 years. He said that the U.K. joined the EEC (European Economic Community) 48 years ago due to the decision of a conservative prime minister named Edward Heath, which proved to be a very controversial decision. In 1974 then prime minster Harold Wilson, sought support in a referendum on the issue of EEC. He said throughout the 1970s and 1980s, it has been a big political debate, and both sides were split on the topic for different reasons.

MR. CALLAHAN explained that in the 1990s, they had the Maastricht Treaty, the forerunner of the European parliament, which was the controversial issue of an economic union becoming a political one. He said over the subsequent years, the decision for the U.K. opting out of the Euro as a single currency was launched at the end of the decade. He said in 2015 the mainstream conservative party promised a yes/no referendum in hopes that they would finally stop the issue. The vote took place in 2016 and the referendum was lost by a narrow but decisive vote to leave the E.U.

MR. CALLAHAN said that since 2016 - the timing of the Brexit vote - the U.K. had broadly matched international equities but started to lag the last 12 months since the pandemic hit. He said the U.K. equity had been lagging but was not convinced that it was due to Brexit, the U.K. stock market has large interest in big oil, banks and areas of international markets that were hit hard in 2020. He said that the impact of Brexit on the economy, currency markets, and U.K. equities has been unclear.

MR. CALLAHAN said that 10 percent of the portfolio was invested in U.K. stocks which consisted of large international businesses that are domiciled in the U.K. He said that Brexit was a big political deal that will have lasting profound consequences, but no one knows what they are yet, and it has not come through in short term investment discussions.

MR HIPPLER asked if the investment with Baillie Gifford was not so much for the U.K. exposure but for international exposure; MR. CALLAHAN said that was correct and explained that the mandate they had with the ARM Board was to invest internationally - an ACWI and All Country World benchmark, which was everything outside the domestic U.S. market.

CHAIR JOHNSON asked how had Brexit affected the trading platform; MR. CALLAHAN said that they were able to negotiate a trade agreement with the EU at the last minute but very little was said about financial services which was about 80 percent of the U.K. economy, so things still needed to be worked out.

MR. WILLIAMS asked if the shift in trading from the U.K. to Amsterdam and the derivatives based in Euros being shifted from the U.K. to New York, impacted their ability to manage the Board's \$450 million in funds; MR. CALLAHAN said that the trading team had four or five years to prepare and were quite comfortable that they were in a position where most of the trading for the Board's portfolio would be done from Edinburgh.

MR. ANDERSON reminded the Board that Baillie Gifford was an independent investment manager based primarily in Edinburgh, Scotland. He said they were founded in 1908 and had always been a private partnership, with 46 partners currently owning the firm, who all work within the firm. He said organizational changes are limited to annual partnership changes that are planned well in advance. He said the partnership structure allows them to keep things simple in order to focus on investment management and client service.

MR. CALLAHAN explained that the portfolio was bottom-up and stock-selection-driven and contains 75 to 80 individual stocks. He noted that the portfolio turnover at around 10 to 20 percent per annum made it a buy and hold portfolio with a pronounced growth bias. He explained that companies with above-average growth in their earnings and cash flows would be rewarded with

superior share price performance.

MR. CALLAHAN said the portfolio is a healthy mix of longstanding holdings with a few newer items competing for a place in the portfolio, which reflects the firm's style as a growth investor. He ended his presentation by saying that he and his colleagues were grateful for the trust the Board placed in the firm and they would do their very best to deliver value-added, long-term returns over the coming years.

H. China and International Equities

MICHAEL BOWMAN introduced GERALD DU MANOIR, the principal investment officer, STEVE CARUTHERS, their investment specialist, and KENT CHAN, who would be part of the question-and-answer session at the end of the presentation. He also introduced KELLY McKALE who was in charge of client relationships in their San Francisco office and DURRELL BROWN who was in their Los Angeles Office.

MR. CARUTHERS said that the portfolio bounced back from a year ago to a recovery of almost 80 percent. He explained that the sector that had the greatest contribution to the portfolio success for 2020 was consumer discretionary and technology stocks which included Ocado, an online U.K. grocer that sells its licensing and technology to grocery store chains world-wide, and Evolution Gaming which had an online offering for live casino games and slot machines. He noted the detractors were Aerospace and areas of metals and mining. He also noted recent additions on the financial side to the portfolio included ING and BBVA. He said that the largest holding in the portfolio was Vale, an iron ore producer in Brazil.

MR. BOWMAN turned the presentation over to KENT CHAN to discuss the importance of China in terms of global economy.

MR. CHAN explained that China's projected economy for 2021 would account for 18 percent of the global economy versus the 24 percent for the U.S. economy. He stated that the majority of the growth of the global economy would be driven by China and emerging markets. He noted that the largest trading partner for China was Europe, and that China is an important part of their decision in a global context.

MR. BOWMAN asked MR. CHAN to discuss how the U.S. and China impact investment decisions in regard to tariffs and restrictions from owning stocks from different countries.

MR. CHAN stated that Capital Group American Funds would follow any guidelines or restrictions from the U.S. government in regard to companies that were not allowed to be invested in. He said that they do not make decisions regarding the portfolio with macro geopolitical issues in mind, they build the portfolio one company at a time. He said they do listen to their political analysts on a regular basis, who discuss global risks and geopolitical developments between the U.S. and China. He noted that there were many opportunities to invest in China that were not politically sensitive, such as industrial automation and pharmaceuticals.

MR. BOWMAN then asked MR. DU MANIOR to comment on the same subject.

MR. DU MANIOR said that he agreed with MR. CHAN's approach to investing in one company at a time, but also pointed out the need to be well aware in long-term investing and the risks of government intervention. He said the second issue was localization of R&D, and that as they build portfolios, they spend a lot of time researching what is proprietary IT and what is not. The third issue was internet companies and how the corporation will operate in the Chinese market. He noted that the Chinese government wants to control what technology would be developed locally and how companies would use the technology. He said with that in mind, they are careful as to how they invest with those companies.

MR. DU MANIOR said that China was no longer an emerging market, that it had already emerged and should be treated as a large stand-alone economy and market. He stated that China was a complicated market with regulations that must be navigated carefully.

MR. CHAN said in response to MR. DU MANIOR's comments, that the takeaway was the potential for innovation stimulated by the competition between the U.S. and China and likened it to the innovation that came out of the Soviet War and the Cold War. He said there would be manufacturing from both sides which would be an area for investments and the regulation of the Chinese Internet giants would create more opportunities for mid cap internet and technology companies.

COMMISSIONER MAHONEY asked what the Chinese strategy for vaccinations in regard to the pandemic would be; MR. CHAN said the Chinese need for vaccines was limited as China was almost past COVID due to strict regulations for isolating travelers into the country as well as tracking them once in quarantine.

MR. HIPPLER asked them to discuss results of the accusations of genocide against the leaders has had regarding Most-Favored-Nation trading status, ESG, and governance; MR. CHAN said the issue with ESG was serious and had shown up in the ESG screens, but had not seen exposure in the portfolio to the atrocities against the Uighurs. He said that if there was an opportunity to invest, they would have serious discussions regarding those implications and would most likely walk away. He said that as far as the Most-Favored-Nation status, he thought that was a topic of debate in Alaska. He said they did not know if Biden would take a tougher stance but believed Biden and the administration would take a collective stance with allies against China.

MR. BOWMAN asked MR. CHAN to discuss if China should be considered as a core allocation in the portfolio.

MR. CHAN said that he thought the answer would be yes because of China's importance in terms of its increased contribution to the global economy; it had impacted investing in many different global sectors. He said that China was the second largest stock market in the world and would eventually trade more than the U. S. stock market.

MR. BOWMAN then asked MR. DU MANOIR to comment on the same question.

MR. DU MANOIR said that they need to think about the opportunity that China offers as a growth opportunity for the next decade. He said that maintaining the capability of recognizing the importance of the market and choosing the right companies was something that they care about.

MR. BOWMAN asked MR. CHAN to comment on what would the sale-ability of China A-shares look like in the future. He also asked MR. DU MANOIR to comment on how they would do that with the portfolio.

MR. CHAN said that China wants to bring foreign institutional investors in because the domestic stock market was too volatile and retail driven, so they are trying to facilitate global institutions to invest in the domestic stock market.

MR. DU MANOIR said they have two groups that spend a lot of time thinking about liquidity. He said they look at the realization speed of the exposure they may be taking, they analyze what the denominator might look like as well as the reality. They also look at information from traders and investment groups; all this goes into how they make investment decision.

MR. WILLIAMS asked if they would comment more on the Cold War statement; MR. CHAN said that the discussion was not about military, and explained that developments that might have been exchanged with the West, may need to be done domestically if that gets cut off. He said that in his opinion, China was going to develop technologies much faster than thought of, in part, because of necessity, but also because of public-private partnerships and their production capability.

I. Crestline Specialty Lending Fund Review

MR. HANNA introduced KEITH WILLIAMS from Crestline to discuss the risk and return aspects of the direct lending asset class.

MR. KEITH WILLIAMS spoke of how Crestline got its start and that it had 139 employees with 70 of them focusing on investing only. He said their credit team in the U.S. was made up of 25 investment professionals and then they have six partners that oversee the firm's investing activity. He said the firm's philosophy was about capital preservation.

MR. KEITH WILLIAMS explained capital structure and described direct lending as investing in a senior secured piece of debt so that you have priority lien on all assets in a company and would be the last to absorb losses. He explained that junior debt typically does not have liens but could be a second lien and it accounted for 20 percent of the capital structure and had a 12 to 16 percent expected return. He said that equity was at the bottom at 30 percent of the capital structure with a higher risk and a higher return expectation.

MR. KEITH WILLIAMS explained that direct lending had an attractive risk-adjusted return rate. He said it had shown minimal losses and higher recoveries, which meant the first to get repaid and last to absorb losses. He explained that those types of loans had a significant amount of covenant protection where the borrower would have to reach milestones or a target at certain times during the loan. He

said the loans were short-term, floating-rate loans.

MR. KEITH WILLIAMS explained that anything sub-\$15 million of EBITDA (earnings before interest, taxes, depreciation, and amortization) was considered lower middle market, \$15 million to \$40 million of EBITDA was traditional middle, and greater than \$40 million was upper middle market which was close to being in the syndicated bank loan market. He explained that their deals had more structural protections, which had been ranging from two and a half to three covenants per deal. He said their cushions were lower than what existed in the upper middle market and syndicated loan market - they do not allow assets to move out of their collateral packages.

MR. KEITH WILLIAMS explained that Mergers and Acquisitions drives the middle market activity. He explained that for every dollar of private equity, one would need \$2.00 of direct lending. He noted that as private equity continued to rise, there would be more opportunities to raise and deploy more money. He explained that they focused on sub-\$100 million opportunities as there were more companies to lend to in that market.

MR. HIPPLER said that Slide 16 showed excess capital. He asked if that was his way of saying that there was an excess of supply and a downward pressure on the yield-to-debt; MR. KEITH WILLIAMS said that was not the case, it was that there was an abundance of private equity capital coming in and the more capital raised, the higher need would be for more direct lending capital.

MR. KEITH WILLIAMS said they were focused on capital preservation, which meant they focused on being top of the capital structure, or last to take on losses, in order to have more control in restructurings if needed. He noted that per Preqin, their first direct lending fund was the top performing direct lending strategy for that 2014 vintage, and that there were no payment defaults in that portfolio. He said that the focus for everything they have done, was in businesses that have one of three attributes which were recurring and contractual revenue, businesses that have asset backing, and businesses that have multiple locations and/or multiple cash flow streams.

MR. WILLIAMS asked if MR. KEITH WILLIAMS felt that in that type of work, what the Board should be looking for in terms of benchmarks; MR. KEITH WILLIAMS said there was an index called Cliffwater that takes the aggregate exposure of the BDC (business development company) market. He said that would give them an idea of what direct lending was doing. He added that they should also take into consideration is that about 70 percent of BDC exposure is actually to first-lien lending, and remaining percent is put into second liens.

MR. ERLENDSON asked if the greater demand for private credit changed the marketplace opportunity for them; MR. KEITH WILLIAMS said they had not seen pressure from increasing rates, but they have seen pressure on the market due to people seeking yield.

ACTION: Crestline Specialty Lending Fund III

MR. HANNA said the staff recommendation was to commit \$100 million to the Crestline Specialty Lending Fund III, which was an increase for an additional \$100 million, not in increase of \$60 million.

MS. HARBO so moved. MR. HIPPLER seconded the motion.

MR. WILLIAMS asked what the motivation for \$100 million, as opposed to \$75 million or \$200 million: MR. HANNA said they were looking to continue their exposure over time and as the size of the fund had grown the upsize in commitment was necessary to continue the same level of 2 percent exposure.

CHAIR JOHNSON reminded the Board that the motion was to accept the recommendation of staff to direct staff to negotiate with Crestline Investors for a commitment of up to \$100 million to Crestline Specialty Lending Fund III, L.P.

A roll call vote was taken, and the motion passed unanimously.

CHAIR JOHNSON recessed the meeting from 11:14 a.m. until 11:22 a.m.

J. PineBridge Investment Review

MR. HANNA introduced PineBridge Investments explaining that they run an \$581 million multiasset portfolio for the ARM Board. He then introduced MICHAEL KELLY and DEANNE NEZAS. He explained that PineBridge was a private and global midsize asset manager.

MR. KELLY said that he ran the multi-asset group and MS. NEZAS was the senior portfolio manager for the account. He said they were multi-asset with private equity, private credit, currencies, equities, and fixed income. He said their risk over a full cycle was close to 60/40 but were aspiring to deliver a return of CPI+5.

MS. NEZAS said their investment philosophy was forward-looking and focused on high conviction investing over an intermediate term horizon. She said they collaborate on a regular basis with each other from locations around the world. She said they found that the nine-to-18-month intermediate term horizon was a time frame that was long enough for prices to converge to fundamentals.

MS. NEZAS explained their three-step investment process which was shown on page 11 of their presentation. She said in step one they develop their five-year view of fundamentals to identify what cash flows would look like over that time frame. She said in step two they focus on the one-third of asset classes where they think the fundamentals would improve in a nine to 18 months' time frame. She said step three was where they would use the information from steps one and two to construct and implement the portfolios.

MS. NEZAS explained the portfolio performance as of January 31st. She said the one-year return was strong at 15.24 percent which outperformed the 60/40 risk budget by 1.71 percent and the fiscal year-to-date return was 21.64 percent, outperforming the 60/40 risk budget by 5.76 percent. She said since inception, the return was 10.69 which underperformed the risk budget by 2.37 percent, but it gained ground with a strong February and was down to 1.72 percent.

MS. NEZAS said the outcomes from step two of their investment process was the risk level of 2.3,

which was a modest risk set for the portfolio and the asset class conviction. She said despite declines in prospective returns, equities remain the most attractive asset classes on their (Capital Market Line) CML.

MS. NEZAS explained they were favoring emerging market fixed income such as EM Corporate. She noted that they continued to hold an allocation to gold which they viewed as a hedge for negative real yields and for equity risk in the portfolio.

MS. NEZAS said that page 19 of their presentation showed the outcome of their three-step process of the portfolio construction. She said that it showed the portfolio as being diverse with 65 percent allocation to equity and equity alternatives, and 35 percent to fixed income and fixed income alternatives.

MR. KELLY commented that they think of every five-year period as the new norm, that there was something different about the market every five years. He said they try to determine what that will mean for cash flows that come out of every asset class and that policy mix matters. He said there had been a lot of discussion the last 10 years about secular stagnation and that the United States used to grow at 3 percent but now it is close to 2 percent and that some believed it was that everyone was getting older and less productive. He said they found that the private sector still grew at 2.8 percent, despite demographics and debt. He said that it had led to a lot of frustration and combined with COVID and the U.S. shifting the policy mix to no longer fiscal counteracting monetary but creating a different environment in the future. He said that would shape the cash flows of every asset class.

MR. KELLY said there was a slow recovery period worldwide after the previous cycle that ended with COVID. He said there was fear of inflation coming back because of fiscal thrusts, but because there is so much slack globally, they thought the fears were premature. He said the cycle was not going to be as long as it was last time, but it is an issue that they consider.

MR. KELLY said that the global savings rate was steady for five decades and after the financial crisis, people became cautious with savings and investments. He said Asia had a high savings rate as well. He said the Global savings rate keeps rising and if it goes high and stays there for a long time, there will be an imbalance between the amount of capital to be invested and the operating cash flows to invest in. He said there was a lot of money going into the system, or liquidity that could not be absorbed by the system so not only was it a savings glut, but a liquidity glut as well. He said that meant that every asset class was going to appear expensive compared to its history. He said that it would eventually disappear but not within the next five years in a way that would be meaningful. He said the excess capital had been going into the bond market and as a result the returns everywhere would be low versus what they used to be.

MR. KELLY said their technology investments were primarily in the FANG stocks, the Googles, and the Amazons and they had become the most expensive. He said the U.K. mid cap stocks was where the anxiety from Brexit had been focused, that it was an inexpensive asset class and poised to improve quite a bit going forward. He said the uncertainty still existed with Brexit in services and financial services.

MR. KELLY said that one of the toughest areas was the fixed income markets - the returns would not be what they were in the past. He said many central banks had an inflation make-up strategy by keeping the real rate of interest much lower than it had been in the past. He noted that it was currently in the negative which meant low-risk fixed income would not be compensate for inflation as a matter of policy. He said the policy for subverting the real interest rates exist mostly in the U.S. and Europe, Asia does not have that type of policy and their rate structures were closer to normal and were where the huge savings pools were.

MR. KELLY said that a lot of people were worried about the policies of big spending and loose monetary policy. He noted that the risk would reach the point where inflation would move to the upside within three to five years.

CHAIR JOHNSON turned to MR. HANNA for the action memorandum.

MR. HANNA said that they were recommending a change to the PineBridge portfolio risk profile. He said a shift from a 60/40 stock/bond risk target that PineBridge discussed, to a 70/30 risk target better aligns the risk of the portfolio with the risk of the overall ARM Board portfolio. He noted that this would not result in a fee increase but does require a change to the PineBridge investment guidelines. He said with respect to the guidelines, they recommended to keep them at a low level, so they recommended repealing the existing resolution and not replacing it with a new resolution, handling that in the contract instead.

MS. HARBO asked if it required two separate motions; MR. HANNA said that he thought it would be the best way to handle it.

CHAIR JOHNSON said the first motion would be with respect to authorization to staff to make the changes to the PineBridge investment guidelines to change the fund benchmark to 70 percent MSCI ACWI IMI and 30 percent Bloomberg Barclay U.S. Aggregate index and the second resolution would be the repeal of Resolution 2019-02.

CHAIR JOHNSON asked for a motion with respect to the first recommendation.

MS. HARBO moved to approve the recommendation. MR. HIPPLER seconded the motion.

A roll call vote was taken on the first motion and <u>passed with seven votes</u>.

CHAIR JOHNSON asked for a motion to repeal Resolution 2019-02.

MS. HARBO moved to approve the resolution. MR. WILLIAMS seconded the motion.

A roll call vote was taken on the second motion and <u>passed with seven votes</u>.

CHAIR JOHNSON recessed the meeting from 12:02 p.m. until 1:16 p.m.

K. Capital Markets Assumptions

MR. HANNA introduced JAY KLOEPFER and ADAM LOZINSKI from Callan, stating they were going to discuss the capital market assumption process and the initial implications for the Board's portfolio, a key part of the annual asset allocation process.

MR. KLOEPFER started his presentation by stating that they make projections because they were the cornerstone of a prudent process and they use them across all investors to help set long-term strategic investment plans. He said they were currently looking out over a 10-year period, as well as a 20-year period for the ARM Board's portfolio and would try to develop results that were defensible for individual asset classes and total portfolios. He said that they try to reflect common sense and recent market developments within reason. He noted that with last year with the market being as tumultuous as it was, they had to reset fixed income expectations, and change their capital market assumptions. He said they did not want to react immediately but waited until summer when things started settling down.

MR. KLOEPFER referenced various slides in his presentation and explained that they think about what the impact of changes might be on investors and what may have changed during the year that would demand a long-term revision to their expectations. He noted that for 2021 they had lowered the fixed income expectations after the pandemic started. He also noted that the S&P 500 fell 33.5 percent peak-to-trough, but it came back up to 18.4 percent to make for a strong year for equity, not to mention fixed income as well. He mentioned that it had been a good year for fixed income; the only asset class that had trouble was REITS and commodities.

MR. KLOEPFER said in looking at the GDP across the globe, the U.K. looked much worse due to the way they measure GDP. He said all the developed markets took similar losses to the U.S. He said unemployment numbers topped out at 14 percent then slid down to 6.7 percent by November. He said housing benefited from the low mortgage rates which led to a lot of activity and said the Feds would not be raising the rates until possibly 2023. He said they track this information because the GDP provides a rough estimate of future earnings growth.

MR. KLOEPFER mentioned that their expectations for GDP was 2.5 for the U.S., weaker for the overseas markets, and stronger for the emerging markets, and all of the forecasts included at least one cycle of recession over the next ten years. He said as far as inflation, they had 2 percent for the U.S. which was 25 basis points lower than projected a year ago.

MR. HIPPLER asked if they should have commodities in the portfolio; MR. KLOEPFER said commodities had always been challenging, but the benefit of commodities had been as an inflation hedge, diversifier, and asset class. MR. HIPPLER noted that for the last 25 years they had returned less than inflation.

MR. LOZINSKI explained the process that went into setting their capital market assumptions. He said they use a building block approach in the form of income, capital gains or losses, credit defaults, and roll return. He said in their forecast they had a positive income expectation, but because of interest rate exposure from holding bonds, they had a capital loss of about 90 basis points and over time as the rates rise, they expected benefits from that by reinvesting. He said they do not see a lot of credit

defaults, they represent a downgrade and if a benchmark gets downgraded from investment grade to high yield, the benchmark has to sell it to realize the loss. He explained that the roll return represents that the forecast assumes an upward sloping yield curve.

MR. LOZINSKI noted that the starting yield would be a strong predictor of the return achieved over the next 10 years.

MR. HIPPLER asked if inflation would exceed the return for the next five years; MR. LOZINSKI stated that would be their projection, they do predict a negative real yield on fixed income and cash over the 10-year period.

MR. WILLIAMS asked what was the overall value of looking carefully at the 10-year forecast; MR. KLOEPFER said they were trying to put out an opinion about the future; MR. LOZINSKI said the goal was not to predict exactly what would happen, but what their general expectations were and how to get those expectations to play out in the market.

MR. LOZINSKI moved on to page 909 that showed their yield forecast rising for five years then holding steady at the yield curve expectation which underlies all fixed income assumptions. He pointed out that it was higher than it was at the end of the year, but at the same place it was in 2015. MR. LOZINSKI noted that private credit can be approached in several ways, however, they try a broad range of possible ways, so they end up at a midpoint range of 6.25 percent on private credit, whereas Crestline targeted at 10 to 13 percent.

COMMISSIONER MAHONEY asked if they were forecasting for 2023 in regards to fixed income; MR LOZINSKI said they had a steadily rising interest rate period for five years and that the 10 years was about where they had it in 2023; COMMISSIONER MAHONEY asked if they anticipated the curve to continue to go up or flatten out in two years; MR. LOZINSKI said that he thought it would be slow and steady upward, assuming the economy continues to recover as expected; MR. KLOEPFER agreed with MR. LOZINSKI'S statement and added that they believed the Fed would kick in next year and start raising rates as well. COMMISSIONER MAHONEY asked if they estimated a half a percent at the end of the curve; MR. LOZINSKI said they felt comfortable with their equilibrium point, given the history and recent rates.

MR. WILLIAMS asked how they were defining capital appreciation; MR. LOZINSKI said they expect the price to fall as yields rise making the price of a bond at the end of 2021 1.5 percent lower than it would have been at the beginning of the year.

MR. LOZINSKI stated that with equity they also used a building block approach with one of the primary building blocks being earnings. He said they had expected earnings to fall 13 percent, but as of March 18th, they had fallen 11 percent. He said despite the decline in earnings the stock market had a huge year. He said there were several explanations for that, and one was that investors were looking beyond the next year and how companies would earn for the long run. He mentioned that low interest rates and the stimulus was helping companies recover as well as driving demand and consumer purchasing.

MR. LOZINSKI said they also looked at valuations that were 1.8 standard deviations above the average and at their highest since the tech bubble. When they looked at all of those factors, it made sense that the valuations were a little too high. He said analysts were expecting earnings to rebound but looking at the valuations he expected valuations to come down a bit for a low positive return on equities in the near term.

MR. LOZINSKI said that the other building blocks they looked at were buyback and dividends. He said that large cap companies tend to buy back more stock than they issue, which had been helpful for equities. He also said that small and midcaps where showing better valuations going into the year so they did not have to assume there would be a pullback in valuations for small and midcap as in large cap.

MR. LOZINSKI said that valuations were better on the international front and dividends tended to be higher than in the U.S. He said emerging markets valuations, excluding India, were the lowest of all the regions, yet they tend to have higher earnings growth. He said to summarize, the return expectation was 6.5 for large cap U.S. equities, which was down 50 basis points from last year and small and midcap had a return expectation of 6.7 takes that down to 55 basis points. He noted that equity risk premium was at 5.5 percent for a 6.5 percent return.

MR. KLOEPFER said they align their expectations with public equity, so they brought that down 50 basis points. He said real estate had held up very well as the shift away from retail and office were already happening when the pandemic hit. He noted that being an ownership asset class, they had lowered the expectation by 50 basis points; it had a return of 5.75 percent which was a bit lower from the previous year of 6.25 percent.

MR. KLOEPFER said that that the compound return expectation for the 10-year outlook would be 6.15, a risk of 13.5 with a projected yield of 2.3 percent, stocks would be 6.5 and bonds would be 1.75. He said for the 20-year outlook returns would be closer to 6.8, down 25 basis points.

COMMISSIONER MAHONEY asked if they had heard any alarming reactions to the lower capital market forecasts; MR. KLOEPFER said that he had not heard any alarms and he was surprised by that. He said there was a reset of expectations to expect less going forward and did not recommend risking up at this time.

MR.WILLIAMS asked if they were interpreting risk more than volatility and how wide would the rage of the projections be if they wanted to have a 95 percent confidence interval; MR. KLOEPFER said that in regards to risk, they looked at the drawdown risk and took it through scenarios that they have developed, and analyze the outcomes, taking into what assets may do better in those situations. MR. LOZINSKI said that they also use simulations to consider the expected range of outcomes.

CHAIR JOHNSON recessed the meeting from 2:24 p.m. to 2:30 p.m.

L. Risk Management

MR. HANNA introduced SHANE CARSON stating that he was there to discuss output from the

ARM Board's risk system as well as updates on liquidity and different portfolio risk levels.

MR. CARSON said there was several risks to the retirement system that should be understood, monitored, and managed. He said the staff analyzed the reporting provided to TruView to answer questions about allocation of investment risk compared to the targets, significant contributors to risks, and how the portfolio performed during certain periods of market stress.

MR. CARSON noted that in December public equities continued to be the main force behind volatility, contributing 63 percent. He said that combined with the volatility of private equity, the equity portfolios contributed 80 percent of the total portfolio's volatility, which was to be expected given the volatile asset class. He said for December the annualized portfolio volatility was at 12.9 percent which was below the expected annualized volatility from the 2020 CMAs. He said in terms of December's monthly value-at-risk, there was a 5 percent probability the portfolio would see a 3.5 percent loss. He said there was nothing alarming or outside of expectations.

MR. CARSON said the two sets of stress tests provided by TruView showed that there was no significant underperformance or out performance between the portfolio and the benchmark.

MR. WILLIAMS asked if there was any separate analysis of what the risks were for the internally managed assets and were they different; MR. CARSON said they did not analyze the internal portfolio separately, it was part of the composition of the total portfolio analysis; MR. WILLIAMS then asked if the large cap and small cap were passive and straightforward or did they have a tilt; MR. CARSON said for the broad domestic, the bulk of the portfolios were passive. He further explained that domestic would have deviations, but the internal equity team manages those closely to the stated benchmark.

MR. HANNA added that they track performances daily for the internal managers and investigate any significant deviations for the expectations.

M. Investment Discussion and Action Items

MR. HANNA said the expectation on an inflation-adjusted basis had decreased less than anticipated by 10 basis points from last year. He said that they were going to recommend options to recover the loss with modest asset allocation changes. He said there was a chance that they may continue to see a decrease over the next few years but would use all tools available to influence risk and return. He said those tools would be increasing risk tolerance, recommending options that modestly increase some of the Board's illiquid assets, and modestly increasing the size of the private equity portfolio. He also said that they expected to build additional capabilities in direct lending. He also noted that there were no short-term expectations to add new asset classes but monitoring potential beta options was ongoing. He said they expected to build on the strength of the international equity portfolio by adding to the size of the active exposure. He said they had reduced costs and plan on continuing their focus down that avenue. He said that he planned on looking at areas in the portfolio where they could use individual asset leverage to enhance returns in a risk-mitigated fashion. He further stated that they may recommend using modest leverage to allow to rebalance fully.

ACTION: Investment Advisory Council (IAC) Reappointment

MR. HANNA said that DR. MITCHELL'S IAC seat was up for renewal and that DR. MITCHELL was willing and available to serve an additional term. MR. HANNA said that it was the staff's recommendation that the Board reappoint DR. MITCHELL to a three-year term beginning July of 2021, to end in June of 2024.

MS. HARBO so moved. MR. HIPPLER seconded the motion.

A roll call vote was taken, and the motion passed unanimously.

ACTION: Deferred Action Items

MS. LEARY announced there were three action memos from the Actuarial Committee. She said the first was regarding the charter of that committee which had been adopted in 2015, but never got to the Board for its approval.

MR. HIPPLER said the committee had reviewed the charter and moved to adopt the charter.

CHAIR JOHNSON stated that as it was a motion made by a committee, there was not a need for a second.

A roll call vote was taken, and the motion passed unanimously.

ACTION: Gabriel Roeder Smith Actuary Review Contract

MS. LEARY said they had the first of two optional one-year extensions approved last year for the review actuary, and the staff recommended to the committee that the Board exercise the second one-year optional extension through June 30, 2022.

MR. HIPPLER said that on behalf of the committee, he moved the for the extension of the contract.

CHAIR JOHNSON asked MS. LEARY to read the motion again before a vote was taken.

MS. LEARY said the recommendation was that the Alaska Retirement Management Board direct staff to exercise the second one-year contract option, extending the contract with GRS until June 30th, 2022.

A roll call vote was taken, and the motion passed unanimously.

ACTION: ARMB Third Actuary Audit Procurement

MS. LEARY said the third action item was for the third actuary audit procurement. She noted that during the December meeting the request was made that staff pursue a sole-source procurement contract with GRS while concurrently managing an expression of interest process for the audit of the

state's actuary. She said they also wanted the audit to focus solely on the recent valuation reports and not the experience study as per the recommendation provided in 2009. She said that they had received two responses besides the submission from GRS to the request for information that they had put out. She said that it was determined that the sole-source procurement contract with GRS was in the best interests of the beneficiaries of the pension and benefit plan due to GRS' longstanding experience and low-cost proposal.

MR. HIPPLER said that on behalf of the committee, he moved to adopt the recommendation.

A roll call vote was taken, and the motion passed unanimously.

UNFINISHED BUSINESS

MR. BRETZ said that he was still concerned with the explanation that was received the day before regarding Senate Bill 55. He said he wanted confirmation that the delay in payment and the possible loss of opportunity cost, if the bill were to pass, that it was outweighed.

CHAIR JOHNSON said that they would put that on the table for further discussion at the June meeting.

NEW BUSINESS

CHAIR JOHNSON said that the Actuarial Committee membership had previously been discussed by the Operations Committee and no motion had been made at that time. He said that it was fair to say that anyone who wanted to be a member of the Actuarial Committee could and should be a member. He said they would need to let himself or MS. JONES know of their desire. He said with no further discussion the issue was considered concluded.

OTHER MATTERS TO PROPERLY COME BEFORE THE BOARD - None.

PUBLIC/MEMBER COMMENTS - None.

INVESTMENT ADVISORY COUNCIL COMMENTS

CHAIR JOHNSON invited Investment Advisory comments and suggested it start with DR. MITCHELL.

DR. MITCHELL thanked the Board for reappointing him. He said it had been one of the highlights of his career and looked forward to continuing his service. He said he thought the presentations were unusually crisp and that the presenters stuck to topic. He singled out Capital Group for their presentation on China and international equity.

MS. RYERSON commented on Callan's 20-year numbers versus the actuarial target but noted that

MS. RYERSON commented on Callan's 20-year numbers versus the actuarial target but noted that their real return of 4.78 versus 4.88 was very close. She also stated that they did not account for the alpha that MR. HANNA and his team add. She noted that the change in the inflation assumption of 50 basis points was huge, but the real return only impacts the assets, whereas inflation impacts both assets and liabilities.

DR. JENNINGS encouraged the Trustees to reflect on the slide in MR. HANNA's presentation regarding the seven actions staff were considering, saying that it distilled a lot of their work. He also said he enjoyed DR. MITCHELL'S presentation.

TRUSTEE COMMENTS

MS. HARBO thanked DR. MITCHELL for his 10 recommendations to the trustees. She also thanked the staff of Administration and Revenue for all the work they do on behalf of all the members.

MR. WILLIAMS said he thought the meetings had been excellent, but that he had missed being together in person. He said he thought the presentations by Capital, Baillie Gifford, and Crestline were strong and appreciated the time and effort that went in to putting it together.

MR. MOEN said that it was a great meeting and he planned on being in Juneau or wherever the next meeting would be.

FUTURE AGENDA ITEMS - None.

ADJOURNMENT

There being no objection and no further business to come before the board, the meeting was adjourned at 3:28 p.m. on March 19, 2021, on a motion made by MS. HARBO and seconded by COMMISSIONER MAHONEY.

Chair of the Board of Trustees
Alaska Retirement Management Board

ATTEST:

Corporate Secretary

Sayle W. Harto

Note: An outside contractor recorded the meeting and prepared the summary minutes. For in-depth discussion and more presentation details, please refer to the recording of the meeting and presentation materials on file at the ARMB office.

STAFF REPORT

Division of Retirement & Benefits Report June 17, 2021

Summary of Monthly Billings / Buck Global LLC

Attached for your information are the quarterly payments related to actuarial services provided by the Division's consulting actuary, Buck Global LLC.

Items listed represent regular and non-regular costs incurred under our current contract.

The listed costs are charged to the System or Plan noted on the column headings.

Summary through the nine months ended March 31, 2021

New for this quarter is the JRS alternative contribution rate for fiscal year 2023, the 100-year project, and the costs related to the Senate Finance Committee presentation.

SUBJECT:	Summary of Monthly Billings -	ACTION:		
	Buck Global LLC		₹7	
DATE:	June 17, 2021	INFORMATION:	X	
-				

BACKGROUND:

AS 37.10.220(a)(8) prescribes that the Alaska Retirement Management Board (Board) "coordinate with the retirement system administrator to have an annual actuarial valuation of each retirement system prepared to determine system assets, accrued liabilities, and funding ratios...."

As part of the oversight process, the Board has requested that the Division of Retirement & Benefits provide quarterly summary updates to review billings and services provided for actuarial valuations and other systems' request.

STATUS:

Attached are the summary totals for the nine months ended March 31, 2021.

Buck Billing Summary

For the Three Months Ended September 30, 2020

		PERS	TRS	JRS	<u>NGNMRS</u>	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations		\$ 54,560	43,653	5,457	5,455	-	-	-	-	-	\$ 109,125
KPMG audit information request		1,245	498	10	35	-	-	-	-	-	1,788
ARMB presentations and meeting attendance		3,411	3,414	-	-	-	-	-	-	-	6,825
FY20 final PERS/TRS contribution rates		3,411	3,414	-	-	-	-	-	-	-	6,825
GASB 67/74		7,572	6,060	759	759	-	-	-	-	-	15,150
GASB 68/75		22,722	18,180	2,274	2,274	-	-	-	-	-	45,450
Salary floor discussion		1,375	-	-	-	-	-	-	-	-	1,375
Projections		6,750	6,750		_						13,500
	TOTAL	\$ 101,046	81,969	8,500	8,523						\$ 200,038
	For the Three Months Ended September 30, 2019	\$ 147,695	107,666	17,109	15,503			8,799			\$ 296,772

For the Three Months Ended December 31, 2020

		PERS	TRS	JRS	<u>NGNMRS</u>	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations		\$ 54,560	43,653	5,457	5,455	-	-	-	-	-	\$ 109,125
KPMG audit information request		2,908	1,163	22	82	-	-	-	-	-	4,175
ARMB presentations and meeting attendance		3,411	3,414	-	-	-	-	-	-	-	6,825
FY20 final PERS/TRS contribution rates		3,411	3,414	-	-	-	-	-	-	-	6,825
GASB 67/74		7,572	6,060	759	759	-	-	-	-	-	15,150
GASB 68/75		22,722	18,180	2,274	2,274	-	-	-	-	-	45,450
Projections		6,750	6,750								13,500
	TOTAL	\$ 101,334	82,634	8,512	8,570						\$ 201,050
	For the Three Months Ended December 31, 2019	\$ 274,942	137,641	17,165	7,722			5,747			\$ 443,217

For the Three Months Ended March 31, 2021

		PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations		\$ 18,186	14,553	1,818	1,818	-	-	-	-	-	\$ 36,375
ARMB presentations and meeting attendance		1,125	1,125	-	-	-	-	-	-	-	2,250
FY20 final PERS/TRS contribution rates		1,125	1,125	-	-	-	-	-	-	-	2,250
JRS Alternative Contribution Rate FY23		-	-	2,851	-	-	-	-	-	-	2,851
100-Year Projection		20,293	8,115	-	-	-	-	-	-	-	28,408
Projections		2,325	2,325	-	-	-	-	-	-	-	4,650
Senate Finance Committee preparation		2,743	1,097								3,840
	TOTAL	\$ 45,797	28,340	4,669	1,818						\$ 80,624
For	the Three Months Ended March 31, 2020	\$ 51,561	34,497	11,277	7,121	-	-	10	-	-	\$ 104,466

Summary through the Nine Months Ended March 31, 2021

	PERS	TRS	JRS	<u>NGNMRS</u>	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations	\$ 127,306	101,859	12,732	12,728	-	-	-	-	-	\$ 254,625
KPMG audit information request	4,153	1,661	32	117	-	-	-	-	-	5,963
ARMB presentations and meeting attendance	7,947	7,953	-	-	-	-	-	-	-	15,900
FY20 final PERS/TRS contribution rates	7,947	7,953	-	-	-	-	-	-	-	15,900
JRS Alternative Contribution Rate FY23	-	-	2,851	-	-	-	-	-	-	2,851
100-Year Projection	20,293	8,115	-	-	-	-	-	-	-	28,408
GASB 67/74	15,144	12,120	1,518	1,518	-	-	-	-	-	30,300
GASB 68/75	45,444	36,360	4,548	4,548	-	-	-	-	-	90,900
Salary floor discussion	1,375	-	-	-	-	-	-	-	-	1,375
Projections	15,825	15,825	-	-	-	-	-	-	-	31,650
Senate Finance Committee preparation	2,743	1,097								3,840
TOTAL	\$ 248,177	192,943	21,681	18,911						481,712
Summary through the Nine Months Ended March 31, 2020	\$ 474,198	279,804	45,551	30,346			14,556			844,455

STAFF REPORT

Division of Retirement & Benefits Report June 17, 2021

Retirement System Membership Activity as of March 31, 2021

Attached for your information are the membership statistics for the quarter ending

- March 31, 2021

We see a net increase in active members from last quarter, all in DCR members:

- PERS Tier 1-3 active members decreased from 10,780 to 10,606 or a decrease of 174.
- PERS DCR active members increased from 24,352 to 24,666 or an increase of 314.
- PERS active members had a net increase of 140.
- TRS Tier 1-2 active members decreased from 3,819 to 3,798 or a decrease of 21.
- TRS DCR active members decreased from 6,432 to 6,405 or a decrease of 27.
- TRS active members had a net decrease of 48.

Retiree counts have changed in the following manner:

- PERS retirees increased from 36,565 to 36,601 or an increase of 36 (all tiers).
- TRS retirees decreased from 13,327 to 13,288 or a decrease of 39 (all tiers).

SUBJECT: Retirement System Membership Activity	ACTION:	
as of March 31, 2021		
DATE: June 17, 2021	INFORMATION:	X

BACKGROUND:

Information related to PERS, TRS, JRS, NGNMRS, SBS, and DCP membership activity as requested by the Board.

STATUS:

Membership information as of March 31, 2021.

MEMBERSHIP STATISTICS AS OF SEPTEMBER 30, 2020

			Р	ERS					TRS			JRS	NGNMRS	SBS	DCP
		D	В		DCR	SYSTEM		DB		DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	795	2,550	7,618	10,963	23,755	34,718	199	3,609	3,808	6,051	9,859	72	n/a	19,567	6,463 ^A
Terminated Members															
Entitled to Future Benefits	268	1,767	3,166	5,201	1,788	6,989	26	638	664	726	1,390	2	n/a	28,873	5,628 ^A
Other Terminated Members	1,019	2,054	7,469	10,542	14,969	25,511	237	1,496	1,733	2,649	4,382	1	n/a	n/a	n/a
Total Terminated Members	1,287	3,821	10,635	15,743	16,757	32,500	263	2,134	2,397	3,375	5,772	3	n/a	28,873	5,628
Retirees & Beneficiaries	22,623	8,862	4,835	36,320	146	36,466	10,111	3,189	13,300	40	13,340	145	711	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,878	5,878	n/a	n/a	n/a	1,508	1,508	n/a	n/a	2,870	2,731
Retirements - 1st QTR FY21	68	167	171	406	17	423	61	237	298	4	302	2	25	n/a	n/a
Full Disbursements - 1st QTR FY21	9	47	79	135	138	273	2	2	4	33	37	-	n/a	123	45
Partial Disbursements - 1st QTR FY21	n/a	n/a	n/a	n/a	33	33	n/a	n/a	n/a	12	12	n/a	n/a	1,199	465

A Revised from prior report

MEMBERSHIP STATISTICS AS OF DECEMBER 31, 2020

			P	ERS					TRS			JRS	NGNMRS	SBS	DCP
		D	В		DCR	SYSTEM	-	DB		DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	752	2,499	7,529	10,780	24,352	35,132	196	3,623	3,819	6,432	10,251	73	n/a	20,381	6,450
Terminated Members															
Entitled to Future Benefits	261	1,701	3,128	5,090	1,830	6,920	24	607	631	689	1,320	2	n/a	28,652	5,830
Other Terminated Members	1,010	2,033	7,428	10,471	15,175	25,646	234	1,471	1,705	2,613	4,318	1	n/a	n/a	n/a
Total Terminated Members	1,271	3,734	10,556	15,561	17,005	32,566	258	2,078	2,336	3,302	5,638	3	n/a	28,652	5,830
Retirees & Beneficiaries	22,502	8,970	4,949	36,421	144	36,565	10,062	3,223	13,285	42	13,327	142	713	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,911	5,911	n/a	n/a	n/a	1,508	1,508	n/a	n/a	3,006	2,884
Retirements - 2nd QTR FY21	52	144	129	325	-	325	8	33	41	2	43	-	23	n/a	n/a
Full Disbursements - 2nd QTR FY21	16	51	86	153	390	543	1	13	14	74	88	-	n/a	471	151
Partial Disbursements - 2nd QTR FY21	n/a	n/a	n/a	n/a	106	106	n/a	n/a	n/a	28	28	n/a	n/a	1,900	692

Prepared by Division of Retirement and Benefits

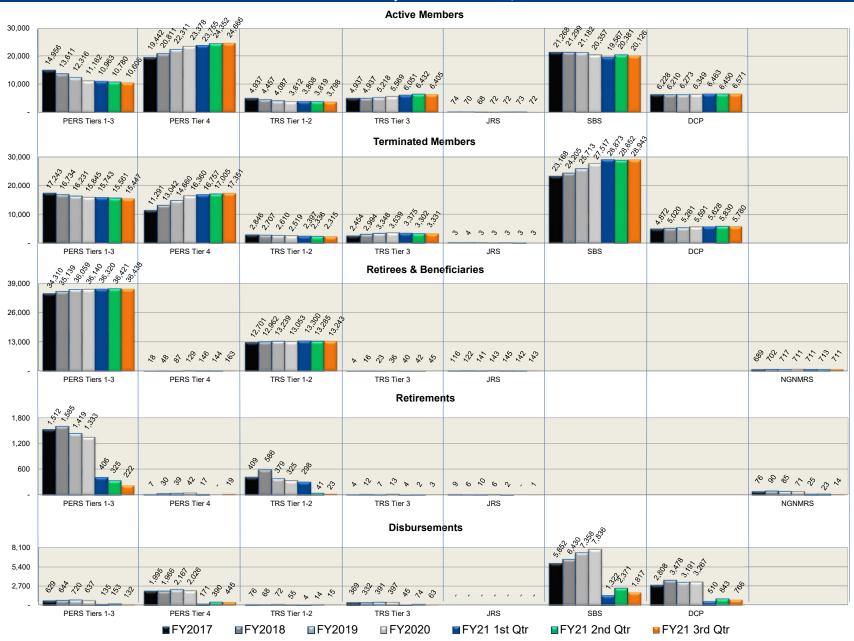
MEMBERSHIP STATISTICS AS OF MARCH 31, 2021

			Р	ERS					TRS			JRS	NGNMRS	SBS	DCP
		D	В		DCR	SYSTEM		DB		DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	732	2,440	7,434	10,606	24,666	35,272	190	3,608	3,798	6,405	10,203	72	n/a	20,126	6,571
Terminated Members															
Entitled to Future Benefits	250	1,666	3,129	5,045	1,896	6,941	21	604	625	701	1,326	2	n/a	28,943	5,780
Other Terminated Members	1,002	2,020	7,380	10,402	15,455	25,857	229	1,461	1,690	2,630	4,320	1	n/a	n/a	n/a
Total Terminated Members	1,252	3,686	10,509	15,447	17,351	32,798	250	2,065	2,315	3,331	5,646	3	n/a	28,943	5,780
Retirees & Beneficiaries	22,363	9,031	5,044	36,438	163	36,601	10,010	3,233	13,243	45	13,288	143	711	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,939	5,939	n/a	n/a	n/a	1,503	1,503	n/a	n/a	3,121	2,970
Retirements - 3rd QTR FY21	36	84	102	222	19	241	7	16	23	3	26	1	14	n/a	n/a
Full Disbursements - 3rd QTR FY21	6	42	84	132	445	577	6	9	15	63	78	-	n/a	512	175
Partial Disbursements - 3rd QTR FY21	n/a	n/a	n/a	n/a	105	105	n/a	n/a	n/a	31	31	n/a	n/a	1,305	591

Alaska Division of Retirement and Benefits

FY 2021 QUARTERLY REPORT OF MEMBERSHIP STATISTICS

Annual & Quarterly Trends as of March 31, 2021



LEGEND

Active Members - All active members at the time of the data pull,

except SBS & DCP, which are counts of contributors during the final quarter of each period.

Terminated Members - All members who have terminated without refunding their account,

except SBS & DCP, which are counts of members with balances at the end of the period less active members.

Retirees & Beneficiaries - All members who have retired from the plans, including beneficiaries eligible for benefits.

Managed Accounts - Individuals who have elected to participate in the managed accounts option with Empower.

Retirements - The number of retirement applications processed.

Full Disbursements - All types of disbursements that leave the member balance at zero.

Partial Disbursements - All types of disbursements that leave the member balance above zero. If more than one partial disbursement is completed during the quarter for a member, they are counted only once for statistical purposes.

Division of Retirement & Benefits Legislative Update – 2021

Bills	Status			
Pension Plans				
HB 55, CSHB 55	REPRESENTATIVE JOSEPHSON	(H) STA, FIN	This bill would open a new PERS Defined Benefits tier allowing current police/fire fighters to elect the new tier or remain in the PERS DCR. Make necessary changes relating to eligibility of peace officers and firefighters for DCR medical, changes to employee contribution as set by the ARMB, and changes to the PRPA program based on the funding of the PERS system.	(H) TRANSMITTED TO (S) 05/19/2021 (H) version: CSHB 55 (FIN)
HB 69	HOUSE RULES BY REQUEST OF THE GOVERNOR	(H) FIN	This legislation is the FY2023 budget bill making appropriations for the operating and loan program expenses of state government and for certain programs; capitalizing funds; amending appropriations; making capital appropriations, supplemental appropriations, and reappropriations; and providing for an effective date.	(S) ENGROSSED AND RETURNED TO HOUSE 5/24
HB 75	HOUSE RULES BY REQUEST OF THE GOVERNOR	(H) L&C, FIN	This legislation removes the 22 percent cap on the payroll contribution to the Public Employees' Retirement System (PERS) for the State of Alaska as a PERS employer. All other PERS employers' rates will remain capped at 22 percent of payroll. The contribution cap, which is lower than the annual actuarially determined contribution rate for the retirement system's normal and past service costs, was implemented to reduce the cost burden on PERS employers. The difference between the 22 percent and the full actuarially determined contribution rate is subsidized by an unrestricted general fund (UGF) annual payment to the retirement system known as the additional state contribution or "on-behalf" payment. This change Allows for full cost share with federal programs and other sources used to fund state programs, thereby reducing general fund expenditures.	(H) FIN

1 of 4 June 4, 2021

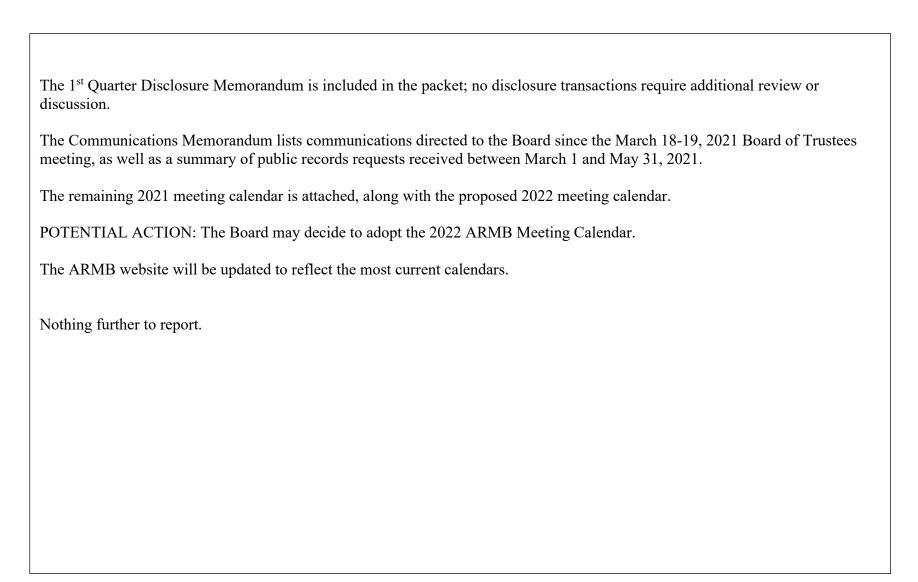
Bill	Sponsor	Referrals	Summary	Status
HB 220	REPRESENTATIVE HOPKINS	(H) L&C, FIN	This legislation provides PERS and TRS employees a choice of choosing between the defined benefits and defined contributions plans.	(H) REFERRED TO LABOR & COMMERCE
SB 6	SENATOR KAWASAKI	(S) EDC, L&C, FIN	This bill offers a temporary retirement incentive program to the defined benefits members of PERS and TRS. It allows qualified members to retire three years early.	(S) FIN
SB 37	SENATOR KIEHL	(S) L&C, FIN	This legislation provides restoration of tenure for certain disabled individuals and certain PERS/TRS employees an opportunity to choose between the defined benefit and defined contribution plans of the Alaska Public Employees' Retirement and the Teachers' Retirement systems.	(S) L&C
SB 49	SENATE RULES BY REQUEST OF THE GOVERNOR	(S) FIN	This legislation is the FY2023 budget bill making appropriations for the operating and loan program expenses of state government and for certain programs; capitalizing funds; amending appropriations; making capital appropriations, supplemental appropriations, and reappropriations; and providing for an effective date.	(S) FIN
SB 55	SENATE RULES BY REQUEST OF THE GOVERNOR	(S) L&C, FIN	This legislation removes the 22 percent cap on the payroll contribution to the Public Employees' Retirement System (PERS) for the State of Alaska as a PERS employer. All other PERS employers' rates will remain capped at 22 percent of payroll. The contribution cap, which is lower than the annual actuarially determined contribution rate for the retirement system's normal and past service costs, was implemented to reduce the cost burden on PERS employers. The difference between the 22 percent and the full actuarially determined contribution rate is subsidized by an unrestricted general fund (UGF) annual payment to the retirement system known as the additional state contribution or "on-behalf" payment. This change Allows for full cost share with federal programs and other sources used to fund state programs, thereby reducing general fund expenditures.	AWAIT TRANSMIT GOV

Bill	Sponsor	Referrals	Summary	Status
SRJ 12	SENATOR WIELECHOWSKI	(S) FIN	This resolution urges the United States Congress to repeal the Windfall Elimination Provision and Government Pension Offset of the Social Security Act.	(S) FIN
Bills	Sponsor	Referrals	Summary	Status
Health Plans				
HB 113	HOUSE RULES BY REQUEST OF THE GOVERNOR	(H) L&C, HSS, FIN	This legislation aims to reduce the cost of health care and improve care quality by addressing the lack of transparent data that is a hallmark of the health care industry today. This bill creates an All-Payer Claims Database (APCD) housed within the Division of Insurance. The APCD could be used to analyze health care cost, quality, and utilization data to aid in advising and making recommendations to policy makers and consumers on health care programs and policies. **Companion bill to SB 93	Has not been scheduled for a hearing
SB 30	SENATOR BEGICH	(S) HSS, L&C, FIN	This legislation requires the AlaskaCare health plans to provide coverage for colorectal cancer screenings.	Has not been scheduled for a hearing.
SB 41	SENATOR HUGHES	(S) L&C, FIN	This legislation requires health care providers and insurers to publicly disclose network pricing agreements. It further requires commercial insurers to establish a cash incentive program to encourage commercially insured individuals to obtain care from lower cost network providers. The bill does not apply these requirements to the AlaskaCare health plans, but directs the Division of Retirement and Benefits to conduct an analysis to evaluate whether the state or employees covered by AlaskaCare health plans would benefit if required to comply with the provisions outlined in the bill.	Heard and held in (S) L&C

Bill	Bill Sponsor Referrals		Status		
SB 93	SENATE RULES BY REQUEST OF THE GOVERNOR	(S) HSS, L&C, FIN	This legislation aims to reduce the cost of health care and improve care quality by addressing the lack of transparent data that is a hallmark of the health care industry today. This bill creates an All-Payer Claims Database (APCD) housed within the Division of Insurance. The APCD could be used to analyze health care cost, quality, and utilization data to aid in advising and making recommendations to policy makers and consumers on health care programs and policies. **Companion bill to HB 113	Heard and held in (S) FIN	

STAFF REPORT

Disclosure – Communications – Calendar Update June 17, 2021



ALASKA RETIREMENT MANAGEMENT BOARD M E M O R A N D U M

To: ARMB Trustees From: Alysia Jones Date: June 1, 2021

Subject: Financial Disclosures

As required by AS 37.10.230 and Alaska Retirement Management Board policy relating to investment conduct and reporting, trustees and staff must disclose certain financial interests. We are hereby submitting to you a list of disclosures for individual transactions made by trustees and staff.

1st Quarter – January 1, 2021 to March 31, 2021

Name	Position Title	Disclosure Type	Disclosure Date
Kayla Wisner	State Comptroller	Equities	3/24/2021
Scott Jones	Head of Investment Operations, Performance, & Analytics	Equities	4/05/2021
Hunter Romberg	Investment Data Analyst	Equities	4/06/2021
Jerrold Mitchell	Investment Advisory Council Member	Equities	4/07/2021
Donald Krohn	ARMB Trustee	Equities / Futures	4/12/2021
Allen Hippler	ARMB Trustee	Equities	4/12/2021
Tina Martin	Accountant IV	Equities	4/14/2021
Michelle Prebula	Public Equity & DC Investment Officer	Equities	4/26/2021

ALASKA RETIREMENT MANAGEMENT BOARD M E M O R A N D U M

To: ARMB Trustees From: Alysia Jones Date: June 11, 2021

Subject: Communications & Information Requests

Communications to Trustees

The following is a list of communications directed to the Board, that were received since the March 18-19, 2021 meeting.

Name	Туре	Contact Date	Topic
Eileen Wagner	Email	4/05/2021	New Yorker Article on Fossil Free Divestment
Michael Salzman	Email	5/6/2021	Request for Board to use votes to address climate crisis
Eileen Wagner	Email	5/21/2021	Articles RE: Divestment from Fossil Fuels (CBC and Bloomberg)
Multiple Individuals	Email	6/2-9/2021	You are putting my pension in jeopardy
Multiple Individuals	Email	6/2-9/2021	Stop Funding the greatest global threat
Multiple Individuals	Email	6/2-9/2021	Protect our pension funds

Public Records Requests

From March 1 – May 31, 2021

Topics	# of Requests	Description
Quarterly Investment Info.	1	Performance data from plan's alternative asset holdings
Meeting Materials	4	Summary of Actions taken at March 18-19, 2021 Meeting
Portfolio of Pension Fund	3	Total value of investment portfolio & percentage of PE; List of investments
Procurement / Contracts	2	List of vendors who responded to RFI for Actuarial Services, RFS for IAC positions
Other	1	Actuarial Experience studies

ALASKA RETIREMENT MANAGEMENT BOARD 2021 Meeting Calendar						
DATE	LOCATION	DESCRIPTION				
September 22 Wednesday	Juneau	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee				
September 23-24 Thursday - Friday	Juneau	Board of Trustees Meeting: *Set Contribution Rates *Audit Results/Assets – Auditor *Approve Budget *Performance Measurement – 2nd Quarter *Real Estate Annual Plan *Real Assets Evaluation – Callan LLC *Manager Presentations				
October 11 Monday	Teleconference	Audit Committee				
December 1 Wednesday	Anchorage	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee				
December 2-3 Thursday-Friday	Anchorage	Board of Trustees Meeting: *Audit Report - DRB Auditor *Performance Measurement – 3rd Quarter *Manager Review (Questionnaire) *Private Equity Evaluation - Callan LLC *Review Private Equity Annual Plan *Manager Presentations				

NOTE: Meeting locations and topics are subject to change.

Updated: 6/28/2021

ALASKA RETIREMENT MANAGEMENT BOARD 2022 Meeting Calendar						
DATE	LOCATION	DESCRIPTION				
March 16 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee				
March 17-18 Thursday-Friday	Juneau, AK	Board of Trustees Meeting: *Performance Measurement – 4 th Quarter *Buck Draft Actuarial Report/GRS Draft Actuary Certification *Capital Markets – Asset Allocation *Manager Presentations				
April 28 Thursday	Teleconference	Actuarial Committee *As necessary: follow-up/additional discussion/questions on valuations				
April 29 Friday	Teleconference	Board of Trustees Meeting *As necessary				
June 15 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee				
June 16-17 Thursday - Friday	Anchorage, AK	Board of Trustees Meeting: *Final Actuary Reports/Adopt Valuation *Adopt Asset Allocation *Performance Measurement - 1st Quarter *Manager Presentations				
September 14 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee				
September 15-16 Thursday - Friday	Anchorage, AK	Board of Trustees Meeting: *Set Contribution Rates *Audit Results/Assets – Auditor *Approve Budget *Performance Measurement – 2nd Quarter *Real Estate Annual Plan *Real Assets Evaluation – Callan LLC *Manager Presentations				
October 11 Tuesday (placeholder)	Teleconference	Audit Committee				
November 30 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee				
December 1-2 Thursday-Friday	Anchorage, AK	Board of Trustees Meeting: *Audit Report - DRB Auditor *Performance Measurement – 3rd Quarter *Manager Review (Questionnaire) *Private Equity Evaluation - Callan LLC *Review Private Equity Annual Plan *Manager Presentations				
NOTE: Meeting locations and topics are subject to change. Approved: 6/17/2021						

Department of Revenue



ALASKA RETIREMENT MANAGEMENT BOARD

PO Box 110405 Juneau, Alaska 99811-0405 Main: 907.465.3749 Fax: 907.465.4397

Chief Investment Officer Report

June 2021

- 1. CIO Update
- 2. Watch List:
 - a. No recommended additions

3. Contracts

a.	02/11/21	Blackrock DC amendment
b.	03/15/21	Genstar X \$25 million private equity commitment
c.	03/26/21	Fidelity Signaling contract amendment
d.	03/26/21	Pinebridge contract amendment
e.	04/16/21	KKR REPA III \$50 million real assets commitment
f.	04/16/21	Almanac IX \$50 million real assets commitment
g.	04/28/21	New York Life Wrap Contract Update for T.Rowe/DC
h.	05/12/21	JP Morgan SmartSpend Contract
i.	05/13/21	Crestline Specialty Lending III \$100 million direct lending commitment
j.	06/01/21	Insight XII \$40 million private equity commitment

4. Portfolio Transaction Update from March 2021 through May 2021

Individual Manager Transactions

March 2021 - May 2021

Asset Class	<u>Total</u>
Fixed Income	642,203,213
Real Assets	125,000,000
Global Equity Ex-US	(202,012,568)
Broad Domestic Equity	(565,190,644)
Private Equity	-
Opportunistic	-
Total	-

<u>Manager</u>	<u>Total</u>	Asset Class	Description of Large Transactions
ARMB Aggregate Bond Fund	400,000,000	Fixed Income	Rebalancing
Short Term Pool	242,203,213	Fixed Income	Rebalancing, benefit payments
ARMB REIT	125,000,000	Real Assets	Rebalancing
ARMB Multi-factor	100,000,000	Dom. Equity	Rebalancing
International Equity Residual Asset	(12,568)	Global Equity Ex-US	
DePrince Race & Zollo Micro Cap	(47,759)	Global Equity Ex-US	
Domestic Residual Assets	(142,885)	Dom. Equity	
ARMB S&P 600	(112,000,000)	Dom. Equity	Rebalancing
SSGA World ex-US IMI	(202,000,000)	Global Equity Ex-US	Rebalancing
ARMB Scientific Beta	(228,000,000)	Dom. Equity	Rebalancing
ARMB S&P 900	(325,000,000)	Dom. Equity	Rebalancing

STAFF REPORT

Fund Financials – Cash Flow Report June 17, 2021

Kayla Wisner, State Comptroller, Department of Revenue

As of April 2021 month-end, total plan assets were as follows: PERS - \$23.5 billion, TRS - \$11.0 billion, JRS - \$272.6 million, NGNMRS - \$48.1 million, SBS - \$5 billion, DCP - \$1.2 billion. Total non-participant directed plans totaled \$32.2 billion, and participant-directed plans totaled \$8.9 billion. Total assets were \$41.0 billion.

Year-to-date income was \$8.1 billion, and the plans experienced a net withdrawal of \$796.3 million. Total assets were up 21.70% year-to-date.

Internally managed assets totaled \$16.3 billion

As of month-end, all plans were within the bands of their asset allocations.

Kevin Worley, Chief Financial Officer, Division of Retirement and Benefits

Presented is the Division of Retirement and Benefits (DRB) Supplement to the Treasury Division's Financial Report as of April 30, 2021.

DRB's supplement report expands on the ARMB Financial Report column "Net Contributions (Withdrawals)" located on pages 1 and 2. DRB reports the summary totals of actual employee and employer, State of Alaska, and other revenue items, as well as benefit payments, refunds & disbursements, and combined administrative & investment expenditures. DRB's supplement report presents cash inflows and outflows for the 10-months ended April 30, 2021 (page 1) and for the month of April 2021 (page 2).

Also presented are participant-directed distributions by plan and by type for the 10-month period on page 3. This page includes Tier information on the defined benefit refunds, and vested percentage on defined contribution distributions.

"Notes for the DRB Supplement to the Treasury Report" includes information for the pension and healthcare plans. Additional information regarding other income is also presented on pages 4 and 5.

ALASKA RETIREMENT MANAGEMENT BOARD FINANCIAL REPORT

As of April 30, 2021

Schedule of Investment Income and Changes in Invested Assets by Fund Fiscal Year-to-Date through April 30, 2021

	113041 1	car-to-Date through Apri	1 30, 2021			% Change due
	Beginning Invested Assets	Investment Income (1)	Net Contributions (Withdrawals)	Ending Invested Assets	% Change in Invested Assets	to Investment Income (2)
Public Employees' Retirement System (PERS)						
Defined Benefit Plans:						
Retirement Trust \$	9,344,522,576 \$	2,282,182,690 \$	(264,719,552) \$	11,361,985,714	21.59%	24.77%
Retirement Health Care Trust	7,755,155,160	1,871,198,591	(269,566,589)	9,356,787,162	20.65%	24.56%
Total Defined Benefit Plans	17,099,677,736	4,153,381,281	(534,286,141)	20,718,772,876	21.16%	24.67%
Defined Contribution Plans:						
Participant Directed Retirement	1,394,890,476	410,911,520	94,415,982	1,900,217,978	36.23%	28.49%
Health Reimbursement Arrangement	477,547,046	121,137,971	38,563,797	637,248,814	33.44%	24.38%
Retiree Medical Plan	139,052,827	35,681,642	14,913,653	189,648,122	36.39%	24.35%
Defined Benefit Occupational Death and Disability:						
Public Employees	28,652,603	7,337,949	2,995,271	38,985,823	36.06%	24.34%
Police and Firefighters	12,730,849	3,220,161	910,032	16,861,042	32.44%	24.42%
Total Defined Contribution Plans	2,052,873,801	578,289,243	151,798,735	2,782,961,779	35.56%	27.17%
Total PERS	19,152,551,537	4,731,670,524	(382,487,406)	23,501,734,655	22.71%	24.95%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	5,375,743,401	1,305,787,647	(239,044,206)	6,442,486,842	19.84%	24.84%
Retirement Health Care Trust	2,928,208,583	708,248,629	(84,004,538)	3,552,452,674	21.32%	24.54%
Total Defined Benefit Plans	8,303,951,984	2,014,036,276	(323,048,744)	9,994,939,516	20.36%	24.74%
Defined Contribution Plans:						
Participant Directed Retirement	581,114,042	171,935,628	29,258,996	782,308,666	34.62%	28.86%
Health Reimbursement Arrangement	140,990,637	35,600,922	10,017,372	186,608,931	32.36%	24.38%
Retiree Medical Plan	47,385,507	11,932,690	3,067,585	62,385,782	31.66%	24.39%
Defined Benefit Occupational Death and Disability	4,732,927	1,184,891	242,053	6,159,871	30.15%	24.41%
Total Defined Contribution Plans	774,223,113	220,654,131	42,586,006	1,037,463,250	34.00%	27.74%
Total TRS	9,078,175,097	2,234,690,407	(280,462,738)	11,032,402,766	21.53%	25.00%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	186,740,196	46,229,823	(1,375,240)	231,594,779	24.02%	24.85%
Defined Benefit Retirement Health Care Trust	33,653,239	8,159,459	(770,726)	41,041,972	21.96%	24.53%
Total JRS	220,393,435	54,389,282	(2,145,966)	272,636,751	23.70%	24.80%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	42,120,154	7,407,427	(1,453,127)	48,074,454	14.14%	17.90%
Other Participant Directed Plans						
Supplemental Annuity Plan	4,226,458,219	854,976,449	(99,293,132)	4,982,141,536	17.88%	20.47%
Deferred Compensation Plan	998,966,337	230,475,087	(30,420,680)	1,199,020,744	20.03%	23.43%
Total All Funds	33,718,664,779	8,113,609,176	(796,263,049)	41,036,010,906		
Total Non-Participant Directed	26,517,235,705	6,445,310,492	(790,224,215)	32,172,321,982	21.33%	24.67%
Total Participant Directed	7,201,429,074	1,668,298,684	(6,038,834)	8,863,688,924	23.08%	23.18%
Total All Funds \$	33,718,664,779 \$, , ,	(796,263,049) \$			24.35%
Notes:		· , , , ,	<u> </u>	, , , , -		

Notes:

⁽¹⁾ Includes interest, dividends, securities lending, expenses, realized and unrealized gains/losses

⁽²⁾ Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates and can be found at: http://treasury.dor.alaska.gov/armb/Reports-and-Policies/Investment-Performance.aspx

Schedule of Investment Income and Changes in Invested Assets by Fund For the Month Ended April 30, 2021

		(Withdrawals)	Assets	% Change in Invested Assets	Investment Income ⁽²⁾
			_		
4 0 60 - 0 0 0 0 0					
1,068,538,893 \$	341,047,549 \$	(47,600,728) \$	11,361,985,714	2.65%	3.09%
9,109,899,656	280,336,246	(33,448,740)	9,356,787,162	2.71%	3.08%
20,178,438,549	621,383,795	(81,049,468)	20,718,772,876	2.68%	3.09%
1,827,189,809	63,545,766	9,482,403	1,900,217,978	4.00%	3.47%
614,231,550	18,939,553	4,077,711	637,248,814	3.75%	3.07%
182,472,811	5,628,447	1,546,864	189,648,122	3.93%	3.07%
37,511,203	1,157,044	317,576	38,985,823	3.93%	3.07%
16,270,178	501,546	89,318	16,861,042	3.63%	3.07%
2,677,675,551	89,772,356	15,513,872	2,782,961,779	3.93%	3.34%
22,856,114,100	711,156,151	(65,535,596)	23,501,734,655	2.82%	3.12%
6,286,243,820	193,631,123	(37,388,101)	6,442,486,842	2.49%	3.09%
3,455,501,742	106,355,520	(9,404,588)	3,552,452,674	2.81%	3.08%
9,741,745,562	299,986,643	(46,792,689)	9,994,939,516	2.60%	3.09%
751,863,898	26,428,822	4,015,946	782,308,666	4.05%	3.51%
179,994,947	5,548,295	1,065,689	186,608,931	3.67%	3.07%
60,195,558	1,855,421	334,803	62,385,782	3.64%	3.07%
5,950,195	183,374	26,302	6,159,871	3.52%	3.08%
998,004,598	34,015,912	5,442,740	1,037,463,250	3.95%	3.40%
10,739,750,160	334,002,555	(41,349,949)	11,032,402,766	2.72%	3.12%
_					
225,215,623	6,941,149	(561,993)	231,594,779	2.83%	3.09%
39,865,498	1,227,311	(50,837)	41,041,972	2.95%	3.08%
265,081,121	8,168,460	(612,830)	272,636,751	2.85%	3.09%
47,041,882	1,143,568	(110,996)	48,074,454	2.20%	2.43%
4,853,775,803	136,490,100	(8,124,367)	4,982,141,536	2.64%	2.81%
					3.09%
	1,226,964,611				
				2.69%	3.08%
8,601,094,772	262,468,465	125,687	8,863,688,924	3.05%	3.05%
, , ,		(120,982,033) \$	41,036,010,906	2.77%	3.08%
	5,950,195 998,004,598 10,739,750,160 225,215,623 39,865,498 265,081,121 47,041,882 4,853,775,803 1,168,265,262 39,930,028,328 31,328,933,556 8,601,094,772	5,950,195 183,374 998,004,598 34,015,912 10,739,750,160 334,002,555 225,215,623 6,941,149 39,865,498 1,227,311 265,081,121 8,168,460 47,041,882 1,143,568 4,853,775,803 136,490,100 1,168,265,262 36,003,777 39,930,028,328 1,226,964,611 31,328,933,556 964,496,146 8,601,094,772 262,468,465	5,950,195 183,374 26,302 998,004,598 34,015,912 5,442,740 10,739,750,160 334,002,555 (41,349,949) 225,215,623 6,941,149 (561,993) 39,865,498 1,227,311 (50,837) 265,081,121 8,168,460 (612,830) 47,041,882 1,143,568 (110,996) 4,853,775,803 136,490,100 (8,124,367) 1,168,265,262 36,003,777 (5,248,295) 39,930,028,328 1,226,964,611 (120,982,033) 31,328,933,556 964,496,146 (121,107,720) 8,601,094,772 262,468,465 125,687	5,950,195 183,374 26,302 6,159,871 998,004,598 34,015,912 5,442,740 1,037,463,250 10,739,750,160 334,002,555 (41,349,949) 11,032,402,766 225,215,623 6,941,149 (561,993) 231,594,779 39,865,498 1,227,311 (50,837) 41,041,972 265,081,121 8,168,460 (612,830) 272,636,751 47,041,882 1,143,568 (110,996) 48,074,454 4,853,775,803 136,490,100 (8,124,367) 4,982,141,536 1,168,265,262 36,003,777 (5,248,295) 1,199,020,744 39,930,028,328 1,226,964,611 (120,982,033) 41,036,010,906 31,328,933,556 964,496,146 (121,107,720) 32,172,321,982 8,601,094,772 262,468,465 125,687 8,863,688,924	5,950,195 183,374 26,302 6,159,871 3.52% 998,004,598 34,015,912 5,442,740 1,037,463,250 3.95% 10,739,750,160 334,002,555 (41,349,949) 11,032,402,766 2.72% 225,215,623 6,941,149 (561,993) 231,594,779 2.83% 39,865,498 1,227,311 (50,837) 41,041,972 2.95% 265,081,121 8,168,460 (612,830) 272,636,751 2.85% 47,041,882 1,143,568 (110,996) 48,074,454 2.20% 4,853,775,803 136,490,100 (8,124,367) 4,982,141,536 2.64% 1,168,265,262 36,003,777 (5,248,295) 1,199,020,744 2.63% 39,930,028,328 1,226,964,611 (120,982,033) 41,036,010,906 20,006 31,328,933,556 964,496,146 (121,107,720) 32,172,321,982 2.69% 8,601,094,772 262,468,465 125,687 8,863,688,924 3.05%

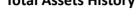
Notes:

⁽¹⁾ Includes interest, dividends, securities lending, expenses, realized and unrealized gains/losses

⁽²⁾ Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates and can be found at: http://treasury.dor.alaska.gov/armb/Reports-and-Policies/Investment-Performance.aspx

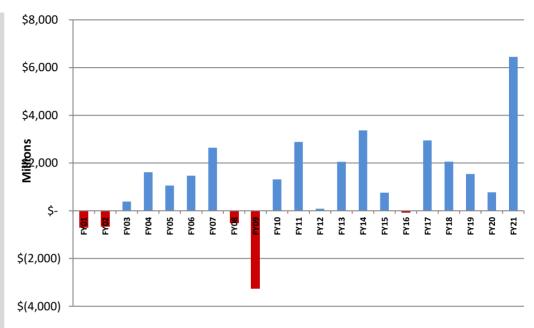
Total Non Participant Directed Assets As of April 30, 2021

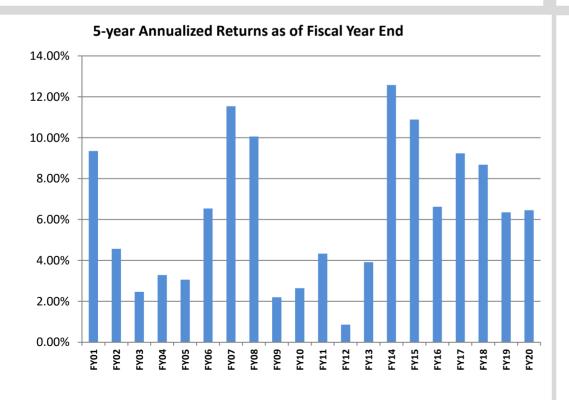
Total Assets History

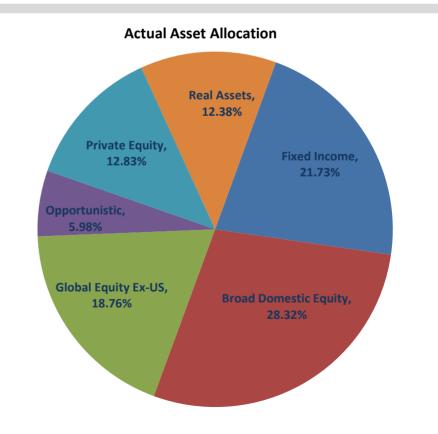








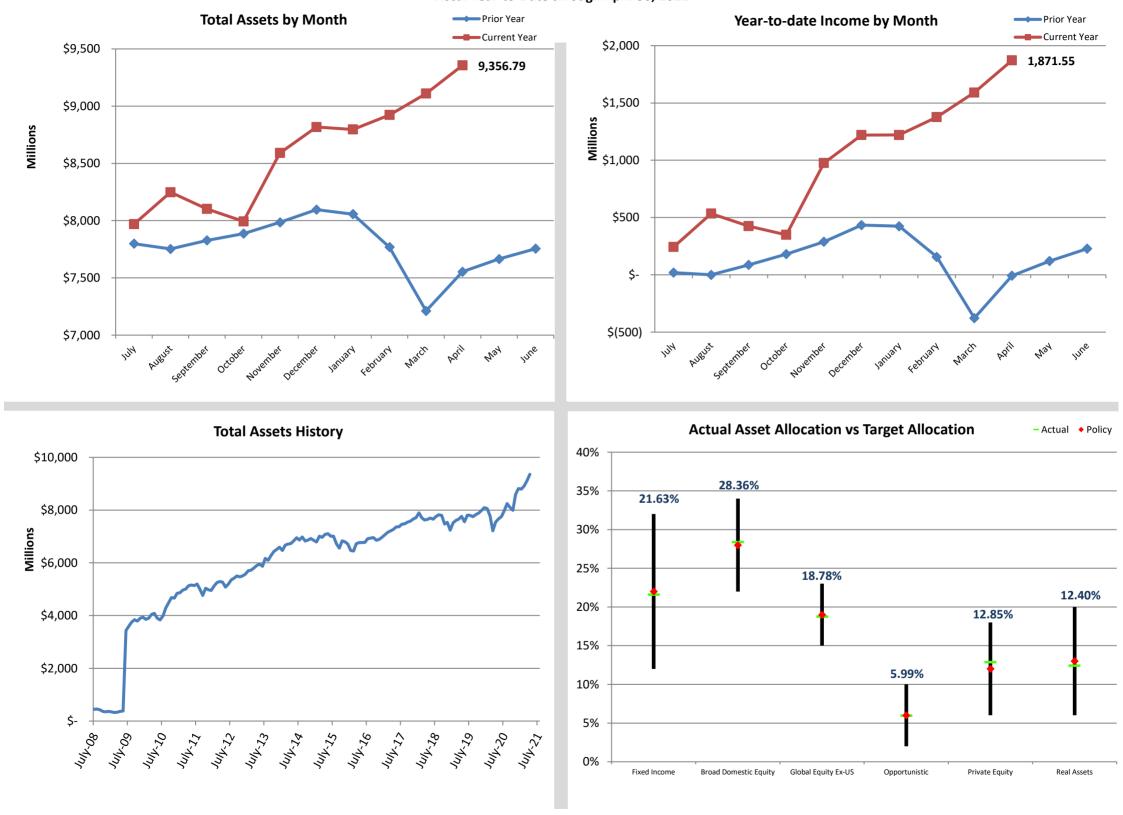




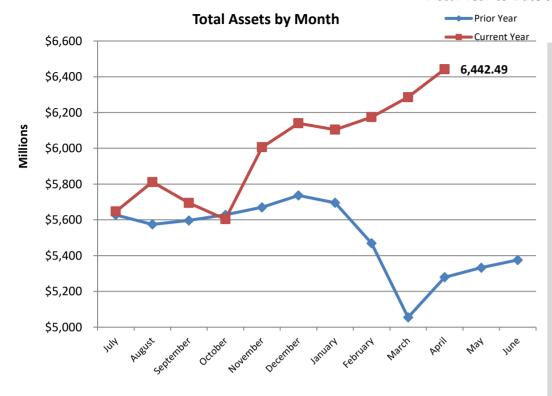
Public Employees' Retirement Pension Trust Fund

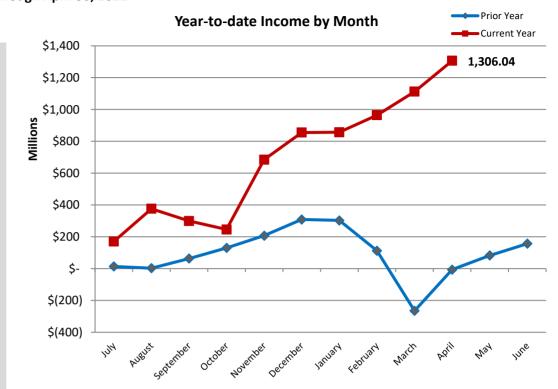


Public Employees' Retirement Health Care Trust Fund

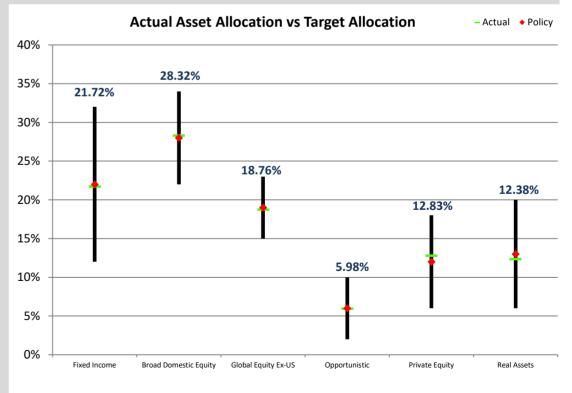


Teachers' Retirement Pension Trust Fund

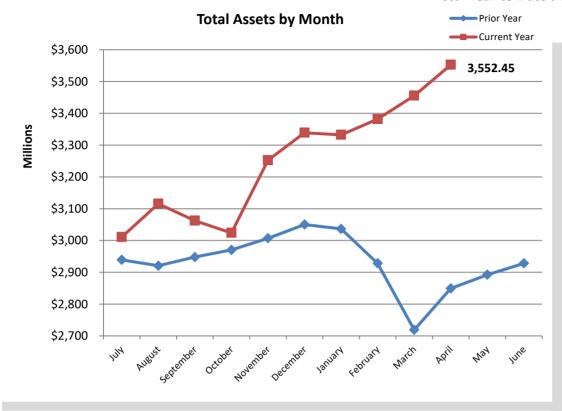


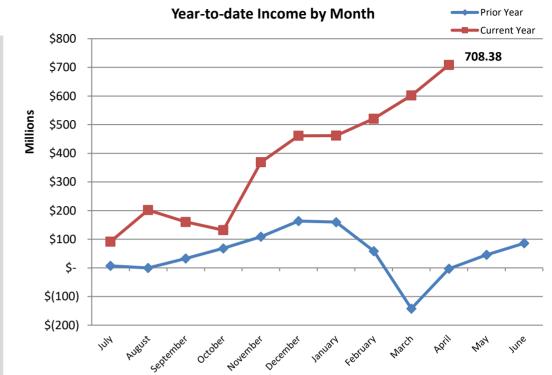


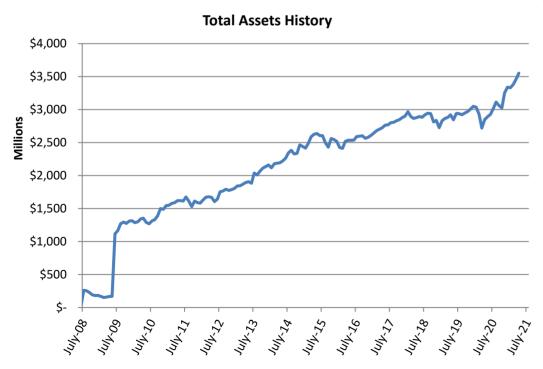


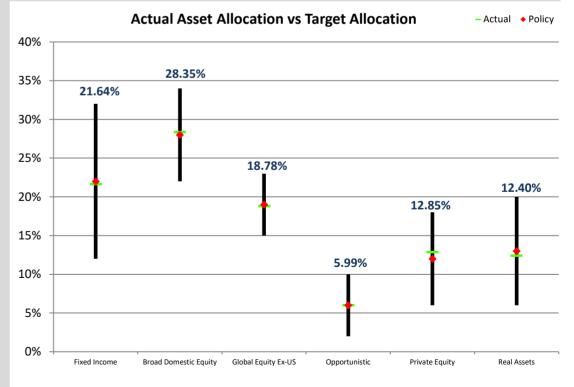


Teachers' Retirement Health Care Trust Fund

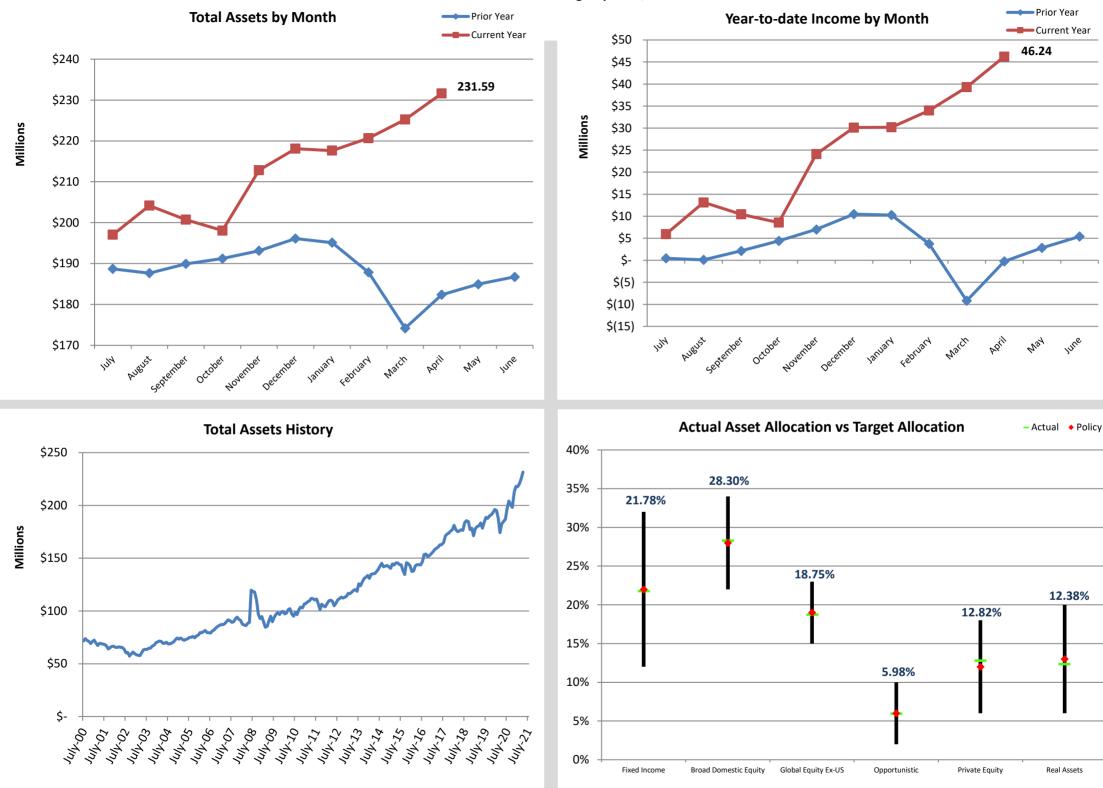




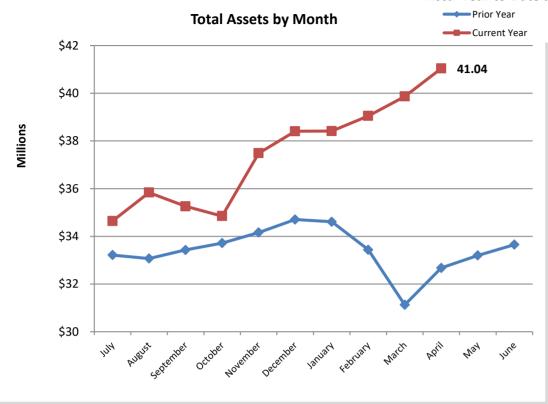


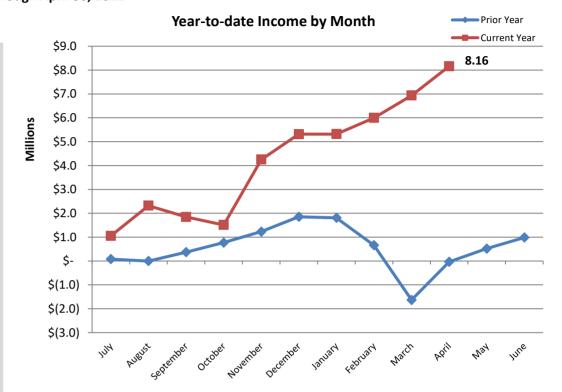


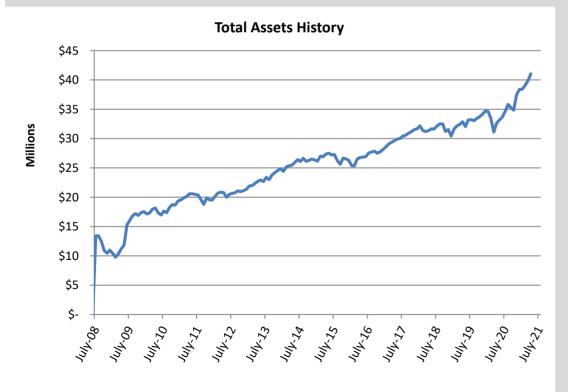
Judicial Retirement Pension Trust Fund

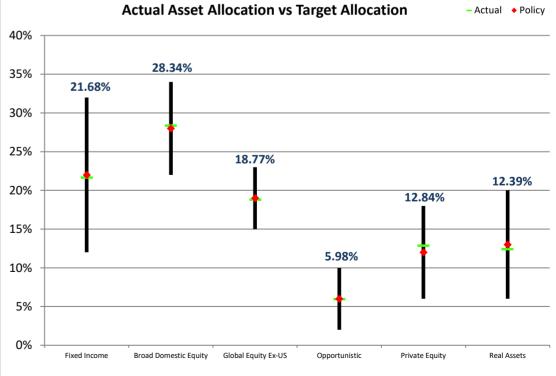


Judicial Retirement Health Care Trust Fund

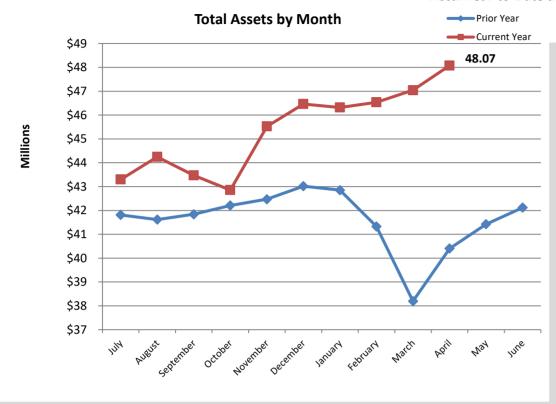


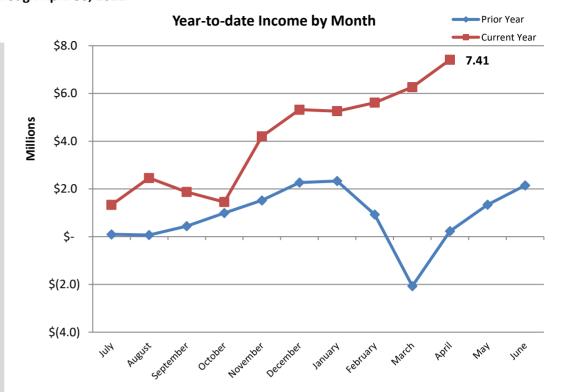




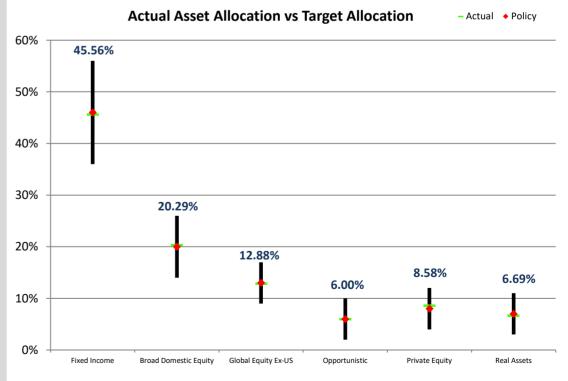


Military Retirement Trust Fund









Reporting of Funds by Manager

All Non-Participant Directed Plans

Alaska Retirement Management Board All Non-Participant Directed Plans by Manager Schedule of Investment Income and Changes in Invested Assets For the Month Ended April 30, 2021

	Beginning Invested Assets	Investment Income	Net Contributions and (Withdrawals)	Ending Invested Assets	% increase (decrease)	% Change due to Investment Income
Cash						
Short-Term Fixed Income Pool	\$ 296,624,865	\$ 21,125	\$ (23,078,210)	\$ 273,567,780	-7.77%	0.01%
Securities Lending Income Pool	78,913	48,551	(79,760)	47,704	-39.55%	124.38%
Total Cash	296,703,778	69,676	(23,157,970)	273,615,484	-7.78%	0.02%
Fixed Income						
Alternative Fixed Income						
Crestline Investors, Inc.	623,571,717	72,769	1,576,486	625,220,972	0.26%	0.01%
Prisma Capital Partners	81,042,852	6,726	-	81,049,578	0.01%	0.01%
Crestline Specialty Fund	8,563,246	-	-	8,563,246	-	-
Crestline Specialty Lending Fund II	42,395,208	-	-	42,395,208	-	-
Total Alternative Fixed Income	755,573,023	79,495	1,576,486	757,229,004	0.22%	0.01%
Opportunistic Fixed Income						
Fidelity Inst. Asset Mgmt. High Yield CMBS	210,275,109	3,003,711	-	213,278,820	1.43%	1.43%
Fidelity Institutional Asset Management	962,134,666	10,065,867	-	972,200,533	1.05%	1.05%
MacKay Shields, LLC	143,077	1,957,768	-	2,100,845	1368.33%	1368.33%
Total Opportunistic Fixed Income	1,172,552,852	15,027,346		1,187,580,198	1.28%	1.28%
ARMB Barclays Agg Bond Fund	4,283,132,744	38,745,834	450,000,000	4,771,878,578	11.41%	0.86%
Total Fixed Income	6,211,258,619	53,852,675	451,576,486	6,716,687,780	8.14%	0.84%
Domestic Equities Small Cap Passively Managed						
ARMB S&P 600	804,382,689	14,043,566	(112,000,000)	706,426,255	-12.18%	1.88%
Total Passive	804,382,689	14,043,566	(112,000,000)	706,426,255	-12.18%	1.88%
Actively Managed	004,302,009	17,073,300	(112,000,000)	100,420,233	-12.10/0	1.00/0
Transition Account						
Total Active					-	-
Total Small Cap	804,382,689	14,043,566	(112,000,000)	706,426,255	-12.18%	1.88%
i otai Siliali Cap	004,302,009	14,043,300	(112,000,000)	100,420,233	-12.10/0	1.00/0

Large Cap						
Passively Managed						
ARMB S&P 900	5,771,573,503	296,940,212	(165,000,000)	5,903,513,715	2.29%	5.22%
Total Passive	5,771,573,503	296,940,212	(165,000,000)	5,903,513,715	2.29%	5.22%
Actively Managed						
ARMB Domestic Residual Assets	6,395	15,036	-	21,431	235.12%	235.12%
ARMB Large Cap Multi-Factor	350,206,271	20,346,342	-	370,552,613	5.81%	5.81%
ARMB Scientific Beta	2,147,805,091	75,673,111	(92,812,962)	2,130,665,240	-0.80%	3.60%
Barrow, Hanley, Mewhinney & Strauss	26	-	-	26	-	-
Transition Account	523	22,244	-	22,767	4253.15%	4253.15%
Total Active	2,498,018,306	96,056,733	(92,812,962)	2,501,262,077	0.13%	3.92%
Total Large Cap	8,269,591,809	392,996,945	(257,812,962)	8,404,775,792	1.63%	4.83%
Total Domestic Equity	9,073,974,498	407,040,511	(369,812,962)	9,111,202,047	0.41%	4.58%
Large Cap						
Arrow Street Capital	695,786,653	22,792,564	730,593	719,309,810	3.38%	3.27%
Baillie Gifford Overseas Limited	284,292,080	9,216,778	303,680	293,812,538	3.35%	3.24%
Brandes Investment Partners	311,365,872	7,536,483	245,736	319,148,091	2.50%	2.42%
Cap Guardian Trust Co	587,316,839	25,861,539	575,945	613,754,323	4.50%	4.40%
Lazard Freres	-	4,759	-	4,759	-	100.00%
Legal & General	892,217,651	27,083,418	76,515	919,377,584	3.04%	3.04%
McKinley Capital Management	2,815,531	62,328	-	2,877,859	2.21%	2.21%
SSgA MSCI World Ex-US IMI Index Fund	2,184,869,606	68,759,412	(152,000,000)	2,101,629,018	-3.81%	3.26%
State Street Global Advisors	201,662	7,639	-	209,301	3.79%	3.79%
Total Large Cap	4,958,865,894	161,324,920	(150,067,531)	4,970,123,283	0.23%	3.30%

Emerging Markets Equity						
MSCI Emerging Markets Index Fund	731,547,629	18,326,716	-	749,874,345	2.51%	2.51%
Legal & General Sci-Beta Emerging Markets	305,086,384	9,861,004	26,646	314,974,034	3.24%	3.23%
Total Emerging Markets	1,036,634,013	28,187,720	26,646	1,064,848,379	2.72%	2.72%
Total Global Equities	5,995,499,907	189,512,640	(150,040,885)	6,034,971,662	0.66%	3.20%
Opportunistic						
Alternative Equity Strategy						
Alternative Equity Strategies Transition Account	-	-	-	-	-	-
McKinley Global Health Care	350,622,357	27,206,051	430,401	378,258,809	7.88%	7.75%
Total Alternative Equity Strategy	350,622,357	27,206,051	430,401	378,258,809	7.88%	7.75%
Alternative Beta						
Man Group Alternative Risk Premia	288,015,079	8,987,221	-	297,002,300	3.12%	3.12%
Total Alternative Beta	288,015,079	8,987,221	-	297,002,300	3.12%	3.12%
Other Opportunities						
Project Pearl	9,362,053	-	-	9,362,053	-	-
Schroders Insurance Linked Securities	11,843,429	(92,852)	-	11,750,577	-0.78%	-0.78%
Total Other Opportunities	21,205,482	(92,852)	-	21,112,630	-0.44%	-0.44%
Tactical Allocation Strategies						
Fidelity Signals	595,317,843	21,095,142	-	616,412,985	3.54%	3.54%
PineBridge	590,635,739	21,507,490	-	612,143,229	3.64%	3.64%
Total Tactical Allocation Strategies	1,185,953,582	42,602,632	-	1,228,556,214	3.59%	3.59%
Total Opportunistic	1,845,796,500	78,703,052	430,401	1,924,929,953	4.29%	4.26%

Private Equity						
Abbott Capital	1,559,750,095	65,937,367	(9,796,095)	1,615,891,367	3.60%	4.24%
Advent International GPE Fund VIII-B	33,179,491	7,463,328	(2,128,423)	38,514,396	16.08%	23.24%
Advent International GPE Fund IX	13,952,915	2,572,905	-	16,525,820	18.44%	18.44%
Angelo, Gordon & Co.	5,514	-	-	5,514	-	-
Clearlake Capital Partners VI	14,782,169	386,981	-	15,169,150	2.62%	2.62%
Dyal Capital Partners III	38,152,703	-	(831,734)	37,320,969	-2.18%	-
Dyal Capital Partners IV	7,406,807	4,746,144	1,427,157	13,580,108	83.35%	58.45%
Glendon Opportunities	21,748,815	4,503,712	-	26,252,527	20.71%	20.71%
Glendon Opportunities II	39,114,285	5,142,658	3,750,000	48,006,943	22.74%	12.55%
KKR Lending Partners II	16,276,468	-	-	16,276,468	-	-
Lexington Capital Partners VIII	29,474,857	3,070,165	(488,488)	32,056,534	8.76%	10.50%
Lexington Partners VII	12,869,024	1,241,549	(307,421)	13,803,152	7.26%	9.76%
Merit Capital Partners	9,939,313	127,291	-	10,066,604	1.28%	1.28%
NB SOF III	15,386,961	(329,075)	-	15,057,886	-2.14%	-2.14%
NB SOF IV	30,640,279	-	-	30,640,279	-	-
New Mountain Partners IV	17,458,683	1,806,745	-	19,265,428	10.35%	10.35%
New Mountain Partners V	39,436,895	8,706,600	1,416,951	49,560,446	25.67%	21.69%
New Mountain Partners VI	707,189	-	1,663,583	2,370,772	235.24%	-
NGP XI	32,856,909	-	(350,528)	32,506,381	-1.07%	-
NGP XII	21,431,090	-	-	21,431,090	-	-
Onex Partnership III	6,846,167	-	(403,210)	6,442,957	-5.89%	-
Pathway Capital Management LLC	1,749,426,517	68,152,011	(11,599,118)	1,805,979,410	3.23%	3.91%
Resolute Fund III	9,902,520	-	(4,812)	9,897,708	-0.05%	-
Resolute Fund IV	57,727,466	4,578,990	(12,566)	62,293,890	7.91%	7.93%
Summit Partners GE IX	63,295,582	-	(4,977,335)	58,318,247	-7.86%	-
Summit Partners GE X	14,399,396	998,807	-	15,398,203	6.94%	6.94%
Warburg Pincus Global Growth Fund	20,211,681	-	-	20,211,681	-	-
Warburg Pincus X	2,549,020	-	(371,700)	2,177,320	-14.58%	-
Warburg Pincus XI	17,339,268	-	-	17,339,268	-	-
Warburg Pincus XII	75,745,860	<u> </u>		75,745,860	-	-
Total Private Equity	3,972,013,939	179,106,178	(23,013,739)	4,128,106,378	3.93%	4.52%

Real Assets						
Farmland						
UBS Agrivest, LLC	873,071,257	-	-	873,071,257	-	-
Total Farmland	873,071,257			873,071,257	-	-
Timber						
Timberland Invt Resource LLC	356,610,786	-	(3,000,000)	353,610,786	-0.84%	-
Total Timber	356,610,786	<u> </u>	(3,000,000)	353,610,786	-0.84%	-
Energy						
EIG Energy Fund XIV-A	4,680,629	113,447	-	4,794,076	2.42%	2.42%
EIG Energy Fund XV	9,134,423	417,713	(1,245,264)	8,306,872	-9.06%	4.91%
EIG Energy Fund XVI	44,778,389	2,716,281	-	47,494,670	6.07%	6.07%
Total Energy	58,593,441	3,247,441	(1,245,264)	60,595,618	3.42%	5.60%
REIT						
REIT Transition Account	-	-	-	-	-	-
ARMB REIT	483,461,897	39,167,031	18,550	522,647,478	8.11%	8.10%
Total REIT	483,461,897	39,167,031	18,550	522,647,478	8.11%	8.10%
Infrastructure Private						
IFM Global Infrastructure Fund-Private	561,739,759	10,518,584	-	572,258,343	1.87%	1.87%
JP Morgan Infrastructure Fund-Private	133,268,684	-	-	133,268,684	-	-
Total Infrastructure Private	695,008,443	10,518,584	-	705,527,027	1.51%	1.51%

Real Estate						
Core Commingled Accounts						
BlackRock US Core Property Fund	328,522,789	-	-	328,522,789	-	-
JP Morgan	155,119,227	1,092,334	(845,907)	155,365,654	0.16%	0.71%
UBS Trumbull Property Fund	45,496,676	482,493	(1,501,580)	44,477,589	-2.24%	1.08%
Total Core Commingled	529,138,692	1,574,827	(2,347,487)	528,366,032	-0.15%	0.30%
Core Separate Accounts						
UBS Realty	293,554	-	-	293,554	-	-
Sentinel Separate Account	181,452,142	-	(451,312)	181,000,830	-0.25%	-
UBS Realty	658,846,332	-	(2,473,463)	656,372,869	-0.38%	-
Total Core Separate	840,592,028	-	(2,924,775)	837,667,253	-0.35%	-
Non-Core Commingled Accounts						
Almanac Realty Securities V	73,349	(13,951)	-	59,398	-19.02%	-19.02%
Almanac Realty Securities VII	24,188,459	368,221	-	24,556,680	1.52%	1.52%
Almanac Realty Securities VIII	10,814,809	1,228,107	1,985,600	14,028,516	29.72%	10.40%
Clarion Ventures 4	28,285,146	-	-	28,285,146	-	-
Colony Investors VIII, L.P.	1,133,905	152,413	-	1,286,318	13.44%	13.44%
Coventry	31,259	(31,259)	-	-	-100.00%	-100.00%
ING Clarion Development Ventures III	1,219,123	-	-	1,219,123	-	-
KKR Real Estate Partners Americas II	19,817,916	-	424,325	20,242,241	2.14%	-
KKR Real Estate Partners Americas L.P.	4,910,581	-	-	4,910,581	-	-
Silverpeak Legacy Pension Partners II, L.P.	1,706,442	-	-	1,706,442	-	-
Silverpeak Legacy Pension Partners III, L.P.	2,609,821	-	-	2,609,821	-	-
Tishman Speyer Real Estate Venture VI	2,028,012	-	-	2,028,012	-	-
Tishman Speyer Real Estate Venture VII	390,949		<u> </u>	390,949	-	-
Total Non-Core Commingled	97,209,771	1,703,531	2,409,925	101,323,227	4.23%	1.73%
Total Real Estate	1,466,940,491	3,278,358	(2,862,337)	1,467,356,512	0.03%	0.22%
Total Real Assets	3,933,686,315	56,211,414	(7,089,051)	3,982,808,678	1.25%	1.43%
Total Assets	\$ 31,328,933,556	\$ 964,496,146	\$ (121,107,720)	\$ 32,172,321,982	2.69%	3.08%

ALASKA RETIREMENT MANAGEMENT BOARD

Reporting of Funds by Manager

Participant Directed Plans

Supplemental Annuity Plan Schedule of Investment Income and Changes in Invested Assets for the Month Ended April 30, 2021

	14p111 0 0, 2021						% Change in	% Change due
	Ве	eginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	Invested Assets	to Investment Income (1)
Participant Options								(_)
T. Rowe Price								
Stable Value Fund	\$	486,756,310 \$	748,012	\$ (3,776,308) \$	2,670,627 \$	486,398,641	-0.07%	0.15%
Small Cap Stock Fund	·	267,228,639	10,573,925	(697,937)	3,402,109	280,506,736	4.97%	3.94%
Alaska Balanced Trust		1,180,927,914	22,475,356	(1,433,256)	1,348,809	1,203,318,823	1.90%	1.90%
Long Term Balanced Fund		751,403,888	21,752,177	(328,399)	(9,189,817)	763,637,849	1.63%	2.91%
AK Target Date 2010 Trust		10,909,214	217,587	(22,746)	(46,545)	11,057,510	1.36%	2.00%
AK Target Date 2015 Trust		81,227,088	1,824,803	(480,533)	(189,254)	82,382,104	1.42%	2.26%
AK Target Date 2020 Trust		91,427,179	2,391,709	(130,050)	(909,869)	92,778,969	1.48%	2.63%
AK Target Date 2025 Trust		109,996,049	3,332,793	179,649	684,078	114,192,569	3.82%	3.02%
AK Target Date 2030 Trust		88,962,053	2,981,197	77,082	65,981	92,086,313	3.51%	3.35%
AK Target Date 2035 Trust		89,235,257	3,248,625	355,381	1,153,004	93,992,267	5.33%	3.61%
AK Target Date 2040 Trust		87,821,491	3,416,478	468,024	185,477	91,891,470	4.63%	3.88%
AK Target Date 2045 Trust		102,810,802	4,208,767	647,476	339,749	108,006,794	5.05%	4.07%
AK Target Date 2050 Trust		115,147,712	4,734,478	702,204	106,026	120,690,420	4.81%	4.10%
AK Target Date 2055 Trust		115,241,970	4,740,902	1,062,796	(406,494)	120,639,174	4.68%	4.10%
AK Target Date 2060 Trust		5,795,948	241,808	242,309	46,730	6,326,795	9.16%	4.07%
AK Target Date 2065 Trust		2,193,092	91,111	95,498	35,193	2,414,894	10.11%	4.03%
Total Investments with T. Rowe Price		3,587,084,606	86,979,728	(3,038,810)	(704,196)	3,670,321,328		
State Street Global Advisors								
Money Market		71,283,943	338	(112,732)	(4,435,105)	66,736,444	-6.38%	0.00%
S&P 500 Stock Index Fund Series A		492,727,869	26,172,152	(2,287,772)	884,303	517,496,552	5.03%	5.32%
Russell 3000 Index		132,258,601	6,828,834	(152,616)	(4,487,777)	134,447,042	1.65%	5.26%
World Equity Ex-US Index		63,809,801	1,902,847	(139,155)	102,725	65,676,218	2.92%	2.98%
Total Investments with SSgA		760,080,214	34,904,171	(2,692,275)	(7,935,854)	784,356,256		
BlackRock								
Passive U.S. Bond Index Fund		193,185,828	1,532,088	(825,685)	(2,171,622)	191,720,609	-0.76%	0.80%
Strategic Completion Fund		32,857,183	1,595,469	(56,856)	342,028	34,737,824	5.72%	4.83%
Total Investments with BlackRock		226,043,011	3,127,557	(882,541)	(1,829,594)	226,458,433		
Brandes and Baillie Gifford								
AK International Equity Fund		128,373,027	3,519,321	(454,013)	6,155,206	137,593,541	7.18%	2.68%
Northern Trust								
Environmental, Social, and Governance Fund		152,194,945	7,959,323	(1,056,728)	4,314,438	163,411,978	7.37%	5.17%
Total All Funds	\$	4,853,775,803 \$	136,490,100	\$ (8,124,367) \$	\$	4,982,141,536	2.64%	2.81%

Notes: Source data provided by the record keeper, Empower Retirement.

⁽¹⁾ Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

Supplemental Annuity Plan

Schedule of Invested Assets with

Schedule of Investment Income and Changes in Invested Assets

By Month Through the Month Ended April 30, 2021

\$ (Thousands)

Invested Assets (at fair value)	July	August	September	October	November	December	January	February	March	April
Investments with T. Rowe Price										
Stable Value Fund	\$ 465,771 \$	470,483 \$	475,886 \$	482,784 \$	485,158 \$	478,527 \$	491,183 \$	487,672 \$	486,756 \$	486,399
Small Cap Stock Fund	202,262	210,954	203,459	205,569	227,173	242,604	241,591	257,804	267,229	280,507
Alaska Balanced Trust	1,116,968	1,131,790	1,117,738	1,107,843	1,155,853	1,173,331	1,167,162	1,172,902	1,180,928	1,203,319
Long Term Balanced Fund	681,497	700,604	688,771	676,181	728,937	748,050	742,118	746,658	751,404	763,638
AK Target Date 2010 Trust	11,197	11,541	11,457	11,074	11,834	11,373	11,303	11,032	10,909	11,058
AK Target Date 2015 Trust	79,289	80,979	79,608	76,532	81,056	82,408	81,347	81,231	81,227	82,382
AK Target Date 2020 Trust	89,384	91,060	88,056	86,058	91,058	92,545	93,522	93,276	91,427	92,779
AK Target Date 2025 Trust	96,924	101,280	98,749	96,729	103,182	107,887	106,972	109,044	109,996	114,193
AK Target Date 2030 Trust	72,048	74,896	73,721	72,400	78,775	81,932	82,673	86,142	88,962	92,086
AK Target Date 2035 Trust	70,541	74,596	72,813	71,820	80,204	83,541	83,706	86,225	89,235	93,992
AK Target Date 2040 Trust	72,115	76,031	73,662	72,385	80,317	83,551	83,390	85,053	87,821	91,891
AK Target Date 2045 Trust	81,618	87,042	84,858	83,293	92,463	97,126	97,165	100,452	102,811	108,007
AK Target Date 2050 Trust	90,760	96,238	93,684	92,386	102,744	107,828	108,165	111,339	115,148	120,690
AK Target Date 2055 Trust	89,572	95,384	93,498	92,255	103,623	108,599	108,550	111,221	115,242	120,639
AK Target Date 2060 Trust	3,289	3,633	3,685	3,713	4,258	4,679	5,247	5,297	5,796	6,327
AK Target Date 2065 Trust	642	778	708	877	1,346	1,147	1,129	1,866	2,193	2,415
State Street Global Advisors										
Money Market	71,394	73,758	76,290	80,188	80,315	76,674	75,856	72,737	71,284	66,736
S&P 500 Stock Index Fund Series A	436,717	462,900	439,674	415,913	455,166	473,831	457,818	469,224	492,728	517,497
Russell 3000 Index	125,246	129,139	124,372	121,779	136,759	139,353	133,558	132,742	132,259	134,447
World Equity Ex-US Index	58,383	57,546	58,638	59,382	69,468	69,780	65,414	62,933	63,810	65,676
Investments with BlackRock										
Passive U.S. Bond Index Fund	203,034	205,613	203,701	204,499	203,785	204,623	205,787	202,387	193,186	191,721
Strategic Completion Fund	33,792	33,816	33,081	31,818	33,696	33,850	33,012	32,822	32,857	34,738
Investments with Brandes and Baillie Gifford										
AK International Equity Fund	83,511	90,728	88,511	85,914	99,609	109,018	112,511	120,095	128,373	137,594
Investments with Northern Trust										
Environmental, Social, and Governance Fund	112,784	122,897	115,825	110,716	121,962	132,659	134,905	144,190	152,195	163,412
Total Invested Assets	\$ <u>4,348,738</u> \$ <u></u>	4,483,686 \$	4,400,443 \$	4,342,107	4,628,742 \$	4,744,918 \$	4,724,085 \$	4,784,345 \$	4,853,776 \$	4,982,142
Change in Invested Assets										
Beginning Assets	\$ 4,226,458 \$	4,348,738 \$		4,400,443 \$	4,342,107 \$		4,744,918 \$		4,784,345 \$	4,853,776
Investment Earnings	132,677	149,038	(77,761)	(42,100)	293,627	128,335	(10,613)	71,139	74,145	136,490
Net Contributions (Withdrawals)	(10,397)	(14,090)	(5,482)	(16,236)	(6,992)	(12,159)	(10,220)	(10,879)	(4,713)	(8,124)
Ending Invested Assets	\$ <u>4,348,738</u> \$	4,483,686 \$	4,400,443 \$	4,342,107 \$	4,628,742 \$	4,744,918 \$	4,724,085 \$	4,784,345 \$	4,853,776 \$	4,982,142

Deferred Compensation Plan Schedule of Invested Assets and Changes in Invested Assets for the Month Ended April 30, 2021

	Be	ginning Invested Assets	1	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
Participant Options				_					
T. Rowe Price									
Stable Value Fund	\$	207,544,316	\$	318,777 \$	(1,741,321) \$	363,584 \$	206,485,356	-0.51%	0.15%
Small Cap Stock Fund		148,792,795		5,857,220	(829,771)	503,707	154,323,951	3.72%	3.94%
Alaska Balanced Trust		38,009,334		728,855	(365,204)	1,657,400	40,030,385	5.32%	1.89%
Long Term Balanced Fund		91,716,042		2,647,091	(460,607)	(1,451,411)	92,451,115	0.80%	2.92%
AK Target Date 2010 Trust		3,442,048		68,168	689	(45,105)	3,465,800	0.69%	1.99%
AK Target Date 2015 Trust		10,361,521		232,232	(3,286)	(737,802)	9,852,665	-4.91%	2.32%
AK Target Date 2020 Trust		24,902,063		651,192	(2,421)	(71,839)	25,478,995	2.32%	2.62%
AK Target Date 2025 Trust		29,572,817		899,316	(23,288)	672,339	31,121,184	5.24%	3.01%
AK Target Date 2030 Trust		17,766,033		596,948	89,478	325,935	18,778,394	5.70%	3.32%
AK Target Date 2035 Trust		12,113,828		438,784	69,475	66,702	12,688,789	4.75%	3.60%
AK Target Date 2040 Trust		12,200,046		473,828	49,499	187,285	12,910,658	5.82%	3.85%
AK Target Date 2045 Trust		9,286,536		379,176	19,150	15,735	9,700,597	4.46%	4.08%
AK Target Date 2050 Trust		7,275,911		297,531	15,243	131,977	7,720,662	6.11%	4.05%
AK Target Date 2055 Trust		5,687,396		232,548	41,123	8,185	5,969,252	4.96%	4.07%
AK Target Date 2060 Trust		1,246,369		51,307	7,482	70,917	1,376,075	10.41%	3.99%
AK Target Date 2065 Trust		450,889		18,491	2,522	4,991	476,893	5.77%	4.07%
Total Investments with T. Rowe Price		620,367,944	_	13,891,464	(3,131,237)	1,702,600	632,830,771		
State Street Global Advisors									
Money Market		23,433,136		109	16,288	(2,110,843)	21,338,690	-8.94%	0.00%
S&P 500 Stock Index		254,727,419		13,542,498	(873,937)	16,018	267,411,998	4.98%	5.33%
Russell 3000 Index		48,122,312		2,487,947	(321,111)	(656,576)	49,632,572	3.14%	5.22%
World Equity Ex-US Index		20,935,262		623,866	(37,262)	96,309	21,618,175	3.26%	2.98%
Total Investments with SSgA		347,218,129	_	16,654,420	(1,216,022)	(2,655,092)	360,001,435		
BlackRock									
Passive U.S. Bond Index Fund		81,739,126		647,502	(93,093)	(1,053,223)	81,240,312	-0.61%	0.80%
Strategic Completion Fund		14,323,386		700,013	(26,625)	139,816	15,136,590	5.68%	4.87%
Total Investments with BlackRock		96,062,512	_	1,347,515	(119,718)	(913,407)	96,376,902		
Brandes and Baillie Gifford									
AK International Equity Fund		53,674,705		1,465,252	(412,388)	1,293,764	56,021,333	4.37%	2.71%
Northern Trust									
Environmental, Social, and Governance Fund		50,941,972		2,645,126	(368,930)	572,135	53,790,303	5.59%	5.18%
Total All Funds	\$	1,168,265,262	\$ _	36,003,777 \$	(5,248,295) \$	\$	1,199,020,744	2.63%	3.09%

Notes: Source data provided by the record keeper, Empower Retirement.

⁽¹⁾ Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

Deferred Compensation Plan

Schedule of Invested Assets with

Schedule of Investment Income and Changes in Invested Assets

By Month Through the Month Ended **April 30, 2021** \$ (Thousands)

Invested Assets (at fair value)	July	August	September	October	November	December	January	February	March	April
Investments with T. Rowe Price	 									-
Stable Value Fund	\$ 205,336 \$	207,965 \$	209,048 \$	209,984 \$	209,731 \$	207,737 \$	209,271	\$ 209,011 \$	207,544 \$	206,485
Small Cap Stock Fund	114,274	117,607	114,901	117,127	130,654	138,703	138,529	146,098	148,793	154,324
Alaska Balanced Trust	28,531	28,203	28,946	30,242	33,138	34,118	34,870	36,404	38,009	40,030
Long Term Balanced Fund	80,739	83,115	82,031	82,082	89,037	90,607	90,716	91,393	91,716	92,451
AK Target Date 2010 Trust	3,405	3,498	3,453	3,352	3,525	3,362	3,399	3,507	3,442	3,466
AK Target Date 2015 Trust	9,902	10,202	10,041	9,844	10,379	10,485	10,385	10,257	10,362	9,853
AK Target Date 2020 Trust	23,102	23,815	23,216	22,220	23,553	23,997	24,269	25,427	24,902	25,479
AK Target Date 2025 Trust	23,997	25,472	24,132	24,083	25,756	27,426	27,995	28,455	29,573	31,121
AK Target Date 2030 Trust	13,690	14,287	14,115	13,925	15,378	16,116	16,496	17,164	17,766	18,778
AK Target Date 2035 Trust	9,250	9,860	9,649	9,563	10,777	11,227	11,009	11,579	12,114	12,689
AK Target Date 2040 Trust	9,767	10,415	10,169	9,763	10,690	11,208	11,252	11,583	12,200	12,911
AK Target Date 2045 Trust	7,338	7,760	7,642	7,303	8,143	8,825	8,740	9,015	9,287	9,701
AK Target Date 2050 Trust	5,155	5,469	5,418	5,357	6,014	6,584	6,784	7,062	7,276	7,721
AK Target Date 2055 Trust	4,906	5,299	5,200	5,068	5,623	5,737	5,441	5,466	5,687	5,969
AK Target Date 2060 Trust	890	955	939	940	1,078	1,176	1,205	1,176	1,246	1,376
AK Target Date 2065 Trust	181	183	182	161	197	416	348	365	451	477
State Street Global Advisors										
Money Market	23,303	23,948	24,254	25,256	25,393	24,909	24,818	23,759	23,433	21,339
S&P 500 Stock Index	224,966	239,819	229,011	220,831	243,237	250,349	241,517	244,302	254,727	267,412
Russell 3000 Index	38,995	41,650	39,470	37,836	42,853	44,850	45,245	46,749	48,122	49,633
World Equity Ex-US Index	17,976	18,012	18,370	18,574	21,684	22,029	20,758	20,619	20,935	21,618
Investments with BlackRock										
Passive U.S. Bond Index Fund	89,300	89,452	89,054	88,593	87,626	86,670	86,867	85,161	81,739	81,240
Strategic Completion Fund	14,840	14,892	14,641	14,075	14,823	14,958	14,766	14,264	14,323	15,137
Investments with Brandes and Baillie Gifford										
AK International Equity Fund	37,777	40,072	39,178	38,048	44,325	47,482	48,959	51,085	53,675	56,021
Investments with Northern Trust										
Environmental, Social, and Governance Fund	40,738	43,478	41,023	39,139	42,759	45,965	46,020	48,613	50,942	53,790
Total Invested Assets	\$ 1,028,357 \$	1,065,430 \$	1,044,083 \$	1,033,367 \$	1,106,376 \$	1,134,936 \$	1,129,660	\$ <u>1,148,516</u> \$	1,168,265 \$	1,199,021
Change in Invested Assets										
Beginning Assets	\$ 998,966 \$	1,028,357 \$	1,065,430 \$	1,044,083 \$	1,033,367 \$	1,106,376 \$	1,134,936	\$ 1,129,660 \$	1,148,516 \$	1,168,265
Investment Earnings	32,812	38,421	(19,581)	(7,945)	75,283	33,765	(2,357)	22,166	21,906	36,004
Net Contributions (Withdrawals)	 (3,421)	(1,348)	(1,767)	(2,772)	(2,274)	(5,205)	(2,920)	(3,310)	(2,156)	(5,248)
Ending Invested Assets	\$ 1,028,357 \$	1,065,430 \$	1,044,083 \$	1,033,367 \$	1,106,376 \$	1,134,936 \$	1,129,660	\$ <u>1,148,516</u> \$ <u></u>	1,168,265 \$	1,199,021

Defined Contribution Retirement - Participant Directed PERS Schedule of Investment Income and Changes in Invested Assets for the Month Ended **April 30, 2021**

		1 pi 11 c	70, 2021			0/ (1)	0/ Cl
	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
Participant Options			((223)			(_)
T. Rowe Price							
Stable Value Fund	\$ 110,217,879 \$	169,894 \$	(245,464) \$	1,055,104 \$	111,197,413	0.89%	0.15%
Small Cap Stock Fund	119,779,727	4,747,593	190,236	2,173,280	126,890,836	5.94%	3.92%
Alaska Balanced Trust	31,636,181	615,048	(43,662)	3,982,979	36,190,546	14.40%	1.83%
Long Term Balanced Fund	13,675,594	380,614	29,584	(3,404,423)	10,681,369	-21.89%	3.17%
AK Target Date 2010 Trust	3,113,990	62,110	18,730	`	3,194,830	2.60%	1.99%
AK Target Date 2015 Trust	13,025,068	293,287	41,644	-	13,359,999	2.57%	2.25%
AK Target Date 2020 Trust	44,629,546	1,164,695	29,825	(83,517)	45,740,549	2.49%	2.61%
AK Target Date 2025 Trust	82,044,990	2,478,642	660,811	(508,828)	84,675,615	3.21%	3.02%
AK Target Date 2030 Trust	89,774,232	3,015,416	619,585	70,105	93,479,338	4.13%	3.35%
AK Target Date 2035 Trust	113,507,346	4,133,565	596,145	(251,916)	117,985,140	3.94%	3.64%
AK Target Date 2040 Trust	132,521,498	5,152,466	926,502	(50,266)	138,550,200	4.55%	3.88%
AK Target Date 2045 Trust	173,844,300	7,093,602	1,243,033	(746,474)	181,434,461	4.37%	4.07%
AK Target Date 2050 Trust	207,706,338	8,528,427	1,643,872	(255,801)	217,622,836	4.77%	4.09%
AK Target Date 2055 Trust	216,004,258	8,870,570	2,523,525	(950,849)	226,447,504	4.83%	4.09%
AK Target Date 2060 Trust	5,143,091	214,138	439,106	47,244	5,843,579	13.62%	3.98%
AK Target Date 2065 Trust	2,124,745	88,266	189,397	15,781	2,418,189	13.81%	3.96%
Total Investments with T. Rowe Price	1,358,748,783	47,008,333	8,862,869	1,092,419	1,415,712,404		
State Street Global Advisors							
Money Market	15,143,131	75	(74,509)	(386,550)	14,682,147	-3.04%	0.00%
S&P 500 Stock Index Fund Series A	72,179,148	3,869,443	389,228	908,145	77,345,964	7.16%	5.31%
Russell 3000 Index	67,637,174	3,464,187	239,927	(4,566,072)	66,775,216	-1.27%	5.29%
World Equity Ex-US Index	49,865,554	1,486,780	146,182	(660,763)	50,837,753	1.95%	3.00%
Total Investments with SSgA	204,825,007	8,820,485	700,828	(4,705,240)	209,641,080		
BlackRock							
Passive U.S. Bond Index Fund	83,858,896	665,061	(227,369)	(1,367,821)	82,928,767	-1.11%	0.80%
Strategic Completion Fund	4,939,986	241,533	23,099	33,392	5,238,010	6.03%	4.86%
Total Investments with BlackRock	88,798,882	906,594	(204,270)	(1,334,429)	88,166,777		
Brandes and Baillie Gifford							
AK International Equity Fund	92,913,134	2,547,198	110,757	5,156,767	100,727,856	8.41%	2.67%
Northern Trust							
Environmental, Social, and Governance Fund	81,904,003	4,263,156	12,219	(209,517)	85,969,861	4.96%	5.21%
Total All Funds	\$ 1,827,189,809 \$	63,545,766 \$	9,482,403 \$	\$	1,900,217,978	4.00%	3.47%

Notes: Source data provided by the record keeper, Empower Retirement.
(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

Defined Contribution Retirement - Participant Directed PERS

Schedule of Invested Assets with

Schedule of Investment Income and Changes in Invested Assets

\$ (Thousands)

By Month Through the Month Ended April 30, 2021

Invested Assets (at fair value)	July	August	September	October	November	December	January	February	March	April
Investments with T. Rowe Price		8					·			
Stable Value Fund	\$ 80,056 \$	83,080 \$	8 7,494 \$	91,379 \$	94,929 \$	98,474 \$	103,908 \$	107,359 \$	110,218 \$	111,197
Small Cap Stock Fund	95,973	98,531	94,742	95,244	104,585	110,886	110,122	116,810	119,780	126,891
Alaska Balanced Trust	6,172	5,193	9,886	14,459	20,274	22,211	24,039	26,775	31,636	36,191
Long Term Balanced Fund	6,440	6,699	9,540	12,526	16,691	17,320	17,401	17,018	13,676	10,681
AK Target Date 2010 Trust	3,080	3,170	3,201	3,176	3,167	3,025	3,176	2,964	3,114	3,195
AK Target Date 2015 Trust	12,097	12,415	12,240	12,031	12,781	12,997	12,954	13,055	13,025	13,360
AK Target Date 2020 Trust	39,535	40,661	40,208	39,953	42,716	43,864	43,395	44,167	44,630	45,741
AK Target Date 2025 Trust	68,499	71,793	70,370	69,734	75,798	78,982	79,219	80,627	82,045	84,676
AK Target Date 2030 Trust	73,322	76,603	75,419	74,524	81,833	85,517	85,737	87,686	89,774	93,479
AK Target Date 2035 Trust	90,031	95,192	93,429	92,478	102,392	107,270	107,208	110,414	113,507	117,985
AK Target Date 2040 Trust	105,521	111,723	108,929	107,516	119,694	125,614	125,759	129,032	132,521	138,550
AK Target Date 2045 Trust	135,169	143,639	140,645	138,355	154,684	163,041	163,661	168,603	173,844	181,434
AK Target Date 2050 Trust	161,065	171,252	167,334	165,706	185,321	195,342	195,656	201,469	207,706	217,623
AK Target Date 2055 Trust	162,577	173,757	170,670	169,804	190,707	201,802	202,475	208,865	216,004	226,448
AK Target Date 2060 Trust	2,275	2,534	2,658	2,808	3,409	3,930	4,296	4,758	5,143	5,844
AK Target Date 2065 Trust	653	755	801	947	1,208	1,444	1,583	1,769	2,125	2,418
State Street Global Advisors										
Money Market	13,567	14,358	17,810	21,330	21,786	18,906	17,756	15,457	15,143	14,682
S&P 500 Stock Index Fund Series A	64,044	72,147	64,969	58,566	61,578	65,824	65,382	68,188	72,179	77,346
Russell 3000 Index	76,824	80,528	75,585	72,352	80,161	79,587	74,026	71,032	67,637	66,775
World Equity Ex-US Index	54,283	52,501	52,890	53,884	62,226	60,735	55,190	51,356	49,866	50,838
Investments with BlackRock										
Passive U.S. Bond Index Fund	89,420	91,328	88,983	86,748	84,354	84,767	86,054	85,082	83,859	82,929
Strategic Completion Fund	4,134	4,178	4,101	3,977	4,270	4,430	4,690	4,819	4,940	5,238
Investments with Brandes and Baillie Gifford										
AK International Equity Fund	60,432	65,756	63,518	61,281	70,450	77,571	80,336	86,570	92,913	100,728
Investments with Northern Trust										
Environmental, Social, and Governance Fund	54,747	58,637	55,816	53,817	59,968	67,292	71,379	78,050	81,904	85,970
Total Invested Assets	\$ 1,459,912 \$	1,536,430 \$	<u>1,511,237</u> \$	1,502,597 \$	1,654,982 \$	1,730,834 \$	1,735,404 \$	1,781,925 \$	1,827,190 \$	1,900,218
Change in Invested Assets										
Beginning Assets	\$ 1,394,890 \$	1,459,912 \$	3 1,536,430 \$	1,511,237 \$	1,502,597 \$	1,654,982 \$	1,730,834 \$	1,735,404 \$	1,781,925 \$	1,827,190
Investment Earnings	57,470	68,222	(35,705)	(18,995)	141,940	63,195	(3,710)	37,718	37,231	63,546
Net Contributions (Withdrawals)	7,552	8,296	10,512	10,355	10,445	12,657	8,280	8,804	8,034	9,482
Ending Invested Assets	\$ <u>1,459,912</u> \$ _	1,536,430 \$	<u>1,511,237</u> \$	1,502,597 \$	1,654,982 \$	1,730,834 \$	1,735,404 \$	1,781,925 \$	1,827,190 \$	1,900,218

Defined Contribution Retirement - Participant Directed TRS Schedule of Investment Income and Changes in Invested Assets for the Month Ended **April 30, 2021**

	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
Participant Options			,		_		
T. Rowe Price							
Stable Value Fund	\$ 43,560,365	\$ 67,400 \$	(84,658) \$	578,550 \$	44,121,657	1.29%	0.15%
Small Cap Stock Fund	48,617,967	1,925,920	110,609	730,028	51,384,524	5.69%	3.93%
Alaska Balanced Trust	12,597,682	245,877	22,652	1,935,963	14,802,174	17.50%	1.81%
Long Term Balanced Fund	5,436,322	150,732	12,748	(1,652,863)	3,946,939	-27.40%	3.27%
AK Target Date 2010 Trust	1,175,005	23,435	8,405	(40,986)	1,165,859	-0.78%	2.02%
AK Target Date 2015 Trust	3,777,129	85,149	29,585	-	3,891,863	3.04%	2.25%
AK Target Date 2020 Trust	13,656,534	357,359	86,999	(38,016)	14,062,876	2.98%	2.61%
AK Target Date 2025 Trust	25,740,961	776,612	94,666	115,309	26,727,548	3.83%	3.00%
AK Target Date 2030 Trust	34,564,306	1,160,895	335,898	174,187	36,235,286	4.83%	3.33%
AK Target Date 2035 Trust	48,360,715	1,759,370	322,125	(224,672)	50,217,538	3.84%	3.63%
AK Target Date 2040 Trust	56,605,773	2,200,974	477,201	-	59,283,948	4.73%	3.87%
AK Target Date 2045 Trust	81,855,481	3,342,876	481,755	(333,106)	85,347,006	4.27%	4.08%
AK Target Date 2050 Trust	115,406,439	4,737,018	698,129	(194,626)	120,646,960	4.54%	4.10%
AK Target Date 2055 Trust	73,035,282	2,998,470	846,656	(190,307)	76,690,101	5.00%	4.09%
AK Target Date 2060 Trust	1,701,654	70,626	135,740	-	1,908,020	12.13%	3.99%
AK Target Date 2065 Trust	273,983	11,298	11,538	-	296,819	8.33%	4.04%
Total Investments with T. Rowe Price	566,365,598	19,914,011	3,590,048	859,461	590,729,118		
State Street Global Advisors							
Money Market	4,393,019	21	(61,761)	41,093	4,372,372	-0.47%	0.00%
S&P 500 Stock Index Fund Series A	21,922,395	1,171,797	124,121	(113,927)	23,104,386	5.39%	5.34%
Russell 3000 Index	27,936,889	1,424,162	82,828	(2,260,621)	27,183,258	-2.70%	5.30%
World Equity Ex-US Index	21,620,760	644,243	62,222	(353,757)	21,973,468	1.63%	3.00%
Total Investments with SSgA	75,873,063	3,240,223	207,410	(2,687,212)	76,633,484		
BlackRock							
Passive U.S. Bond Index Fund	32,746,436	260,196	54,330	(444,623)	32,616,339	-0.40%	0.80%
Strategic Completion Fund	1,461,544	72,291	10,735	44,118	1,588,688	8.70%	4.86%
Total Investments with BlackRock	34,207,980	332,487	65,065	(400,505)	34,205,027		
Brandes and Baillie Gifford							
AK International Equity Fund	39,843,839	1,090,339	96,981.00	2,241,859	43,273,018	8.61%	2.66%
Northern Trust							
Environmental, Social, and Governance Fund	35,573,418	1,851,762	56,442.00	(13,603)	37,468,019	5.33%	5.20%
Total All Funds	\$ 751,863,898	\$ 26,428,822 \$	4,015,946 \$	\$	782,308,666	4.05%	3.51%

Notes: Source data provided by the record keeper, Empower Retirement.
(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

Defined Contribution Retirement - Participant Directed TRS Schedule of Invested Assets with

Schedule of Investment Income and Changes in Invested Assets

\$ (Thousands)

By Month Through the Month Ended April 30, 2021

Invested Assets (at fair value) July August September October November **December** January **February** March April Investments with T. Rowe Price Stable Value Fund \$ 31,324 \$ 33,005 \$ 33,819 \$ 35,426 \$ 37,071 \$ 38,615 \$ 40,583 \$ 42,553 \$ 43,560 \$ 44,122 Small Cap Stock Fund 40,640 41,198 39,239 39,353 42,554 44,966 44,719 47,282 48,618 51,385 974 9,093 12,598 Alaska Balanced Trust 1,456 2,903 4,989 7,462 8,252 10,384 14,802 Long Term Balanced Fund 2,518 2,580 3,802 4,962 6,652 6,973 7,166 6,925 5,436 3,947 1,027 1,054 AK Target Date 2010 Trust 1,043 1,041 1,102 1,137 1,140 1,157 1,175 1,166 AK Target Date 2015 Trust 3,973 3,818 3,782 3,607 3,848 3,846 3,670 3,890 3,777 3,892 13,657 AK Target Date 2020 Trust 12,133 12,377 11,993 11,962 12,900 13,299 13,296 13,437 14,063 AK Target Date 2025 Trust 21,903 22,699 21,971 21,672 23,620 24,391 24,692 25,221 25,741 26,728 AK Target Date 2030 Trust 27,943 28,909 28,201 28,040 30,917 32,396 32,711 33,523 34,564 36,235 AK Target Date 2035 Trust 39,332 40,946 40,011 39,609 43,504 45,604 45,612 46,919 48,361 50,218 AK Target Date 2040 Trust 44,653 46,518 45,538 44,926 50,146 52,966 53,170 54,790 56,606 59,284 AK Target Date 2045 Trust 64,726 68,216 66,265 65,461 73,340 77,031 77,167 79,342 81,855 85,347 AK Target Date 2050 Trust 91,622 96,600 93,618 92,633 103,711 108,957 108,723 111,925 115,406 120,647 63,905 AK Target Date 2055 Trust 55,732 58,638 57,167 56,882 67,530 67,720 70,242 73,035 76,690 642 1,702 AK Target Date 2060 Trust 679 695 800 1,022 1,228 1,327 1,507 1,908 67 71 74 109 128 138 274 297 AK Target Date 2065 Trust 86 158 State Street Global Advisors 4,593 4,324 5,779 7,055 8,192 6,934 4,458 4,372 Money Market 5,668 4,393 23,623 21,922 S&P 500 Stock Index Fund Series A 20,914 20,868 18,143 18,334 19,331 19,710 20,931 23,104 Russell 3000 Index 32,959 34,043 31,978 30,694 33,599 33,040 30,557 29,109 27,937 27,183 World Equity Ex-US Index 24,234 23,131 23,080 23,371 26,886 26,223 23,796 22,110 21,621 21,973 Investments with BlackRock Passive U.S. Bond Index Fund 36,533 37,407 35,855 34,669 33,570 33,802 34,406 33,441 32,746 32,616 Strategic Completion Fund 1,345 1,444 1,267 1,249 1,364 1,357 1,347 1,366 1,462 1,589 Investments with Brandes and Baillie Gifford **AK International Equity Fund** 26,438 28,458 27,280 26,255 29,979 32,979 34,355 37,004 39,844 43,273 Investments with Northern Trust Environmental, Social, and Governance Fund 23,663 24,912 23,719 22,818 25,322 28,475 30,496 33,574 35,573 37,468 610,370 \$ 635,624 679,107 \$ 711,263 \$ 731,246 \$ 751,864 **Total Invested Assets** 619,945 \$ 615,705 \$ 709,460 782,309 **Change in Invested Assets Beginning Assets** 610,370 \$ 635,624 \$ 615,705 \$ 581,114 \$ 619,945 \$ 679,107 \$ 709,460 \$ 711,263 \$ 731,246 \$ 751,864 **Investment Earnings** 24,312 28,829 (14,972)(7,901)59,262 26,356 (1,557)15,710 15,469 26,429 Net Contributions (Withdrawals) 4,944 (3,575)(707)3,661 4,141 3,998 3,359 4,274 5,149 4,016 610,370 \$ 635,624 619,945 \$ 615,705 \$ 679,107 \$ 709,460 \$ 711,263 \$ 731,246 \$ 751,864 782,309 **Ending Invested Assets**

ALASKA RETIREMENT MANAGEMENT BOARD

FINANCIAL REPORT (Supplement to the Treasury Division Report)

As of April 30, 2021

Prepared by the Division of Retirement & Benefits

ALASKA RETIREMENT MANAGEMENT BOARD SCHEDULE OF NON-INVESTMENT CHANGES BY FUND

(Supplement to the Treasury Division Report) For the Ten Months Ending April 30, 2021

	Contributions						Net			
	Contributions			Total			Refunds &	Administrative	Total	Contributions/
	EE and/or ER	State of Alaska	Other	Contributions		Benefits	Disbursements	& Investment	Expenditures	(Withdrawals)
Public Employees' Retirement System (PERS)										
Defined Benefit Plans:	e 212.040.012	e 202.505.000 e	00.221 #	515 706 122	e	(770,000,222)	((440.0(3) . ft	(2.007.500) 0	(700 425 (05)	e (264.710.552)
Retirement Pension Trust Retirement Health Care Trust	\$ 312,040,912	\$ 203,585,000 \$	80,221 \$		\$	(770,088,323) \$	6,449,862) \$		(780,425,685)	\$ (264,719,552)
Total Defined Benefit Plans	59,429,061 371,469,973	203,585,000	68,234,156 68,314,377	127,663,217 643,369,350		(376,067,483) (1,146,155,806)	(6,449,862)	(21,162,323) (25,049,823)	(397,229,806) (1,177,655,491)	(269,566,589) (534,286,141)
Total Defined Benefit Flans	3/1,409,9/3	203,363,000	00,314,377	043,309,330		(1,140,133,600)	(0,449,802)	(23,049,623)	(1,177,033,491)	(334,200,141)
Defined Contribution Plans:										
Participant Directed Retirement	154,803,307	-	-	154,803,307		-	(55,678,277)	(4,709,048)	(60,387,325)	94,415,982
Health Reimbursement Arrangement (a)	38,904,858	_	_	38,904,858		(213,218)	_	(127,843)	(341,061)	38,563,797
Retiree Medical Plan (a)	15,367,575	_	71,596	15,439,171		(441,223)	_	(84,295)	(525,518)	14,913,653
Occupational Death and Disability: (a)	13,307,373		71,550	15,157,171		(111,223)		(01,275)	(323,310)	11,713,033
All Others	3,100,263			3,100,263		(90,729)		(14,263)	(104,992)	2,995,271
Peace Officers and Firefighters	1.215.155		_	1,215,155		(281,592)	-	(23.531)	(305,123)	910.032
Total Defined Contribution Plans	213,391,158		71,596	213,462,754		(1,026,762)	(55,678,277)	(4,958,980)	(61,664,019)	151,798,735
Total PERS	584,861,131	203,585,000	68,385,973	856,832,104		(1,147,182,568)	(62,128,139)	(30,008,803)	(1,239,319,510)	(382,487,406)
					_					
Teachers' Retirement System (TRS)										
Defined Benefit Plans:										
Retirement Pension Trust	47,510,290	134,976,000	32,103	182,518,393		(418, 356, 314)	(1,114,110)	(2,092,175)	(421,562,599)	(239,044,206)
Retirement Health Care Trust	18,359,287	-	23,077,892	41,437,179		(119,739,809)	-	(5,701,908)	(125,441,717)	(84,004,538)
Total Defined Benefit Plans	65,869,577	134,976,000	23,109,995	223,955,572		(538,096,123)	(1,114,110)	(7,794,083)	(547,004,316)	(323,048,744)
Defined Contribution Plans:	51 200 405			51 200 407			(20, 200, 464)	(1.752.047)	(22.041.411)	20.250.006
Participant Directed Retirement	51,300,407	-	-	51,300,407		-	(20,288,464)	(1,752,947)	(22,041,411)	29,258,996
Health Reimbursement Arrangement (a)	10,148,183	-	-	10,148,183		(92,746)	-	(38,065)	(130,811)	10,017,372
Retiree Medical Plan (a)	3,336,313	-	4,116	3,340,429		(224,609)	-	(48,235)	(272,844)	3,067,585
Occupational Death and Disability (a)	271,934	-	-	271,934		(20,244)	-	(9,637)	(29,881)	242,053
Total Defined Contribution Plans	65,056,837	-	4,116	65,060,953		(337,599)	(20,288,464)	(1,848,884)	(22,474,947)	42,586,006
Total TRS	130,926,414	134,976,000	23,114,111	289,016,525	_	(538,433,722)	(21,402,574)	(9,642,967)	(569,479,263)	(280,462,738)
Judicial Retirement System (JRS)										
Defined Benefit Plan Retirement Pension Trust	5,561,017	5,145,000	-	10,706,017		(11,977,206)	-	(104,051)	(12,081,257)	(1,375,240)
Defined Benefit Plan Retirement Health Care Trust Total JRS	576,323 6,137,340	5,145,000	195,124 195,124	771,447 11,477,464		(1,483,822) (13,461,028)	-	(58,351) (162,402)	(1,542,173)	(770,726)
1 otal 3 KS	0,137,340	5,145,000	195,124	11,4 / /,404	_	(13,401,028)	-	(102,402)	(13,623,430)	(2,145,966)
National Guard/Naval Militia Retirement System (NGNMRS)										
Defined Benefit Plan Retirement Pension Trust (a)						(1.250.656)		(102.471)	(1.452.127)	(1.452.127)
Defined Benefit Flan Rethement Fension Trust		-				(1,350,656)		(102,471)	(1,453,127)	(1,453,127)
Other Participant Directed Plans										
Supplemental Annuity Plan (SBS)	141,465,330	_	_	141,465,330		_	(233,522,503)	(7,235,959)	(240,758,462)	(99,293,132)
Supplemental Annuity Fian (SBS)	141,405,550			141,405,550	_		(233,322,303)	(1,233,737)	(240,730,402)	(77,273,132)
Deferred Compensation Plan (b) (DCP)	26 920 076			26 920 076			((5.220.770)	(1.010.077)	(67.250.756)	(20.420.680)
Deferred Compensation Plan (DCP)	36,839,076	-	-	36,839,076	_	-	(65,339,779)	(1,919,977)	(67,259,756)	(30,420,680)
Total All Funda	000 220 201	242 706 000	01 (05 200	1 225 (20 400		(1.700.427.074)	(292 202 005)	(40.072.570)	(2 121 902 549)	(706.262.040)
Total All Funds	900,229,291	343,706,000	91,695,208	1,335,630,499		(1,700,427,974)	(382,392,995)	(49,072,579)	(2,131,893,548)	(796,263,049)
Total Non-Participant Directed	515.821.171	343,706,000	91,695,208	951,222,379		(1,700,427,974)	(7,563,972)	(33,454,648)	(1,741,446,594)	(790,224,215)
Total Participant Directed	384,408,120	343,700,000	71,093,200	384,408,120		(1,700,727,774)	(374,829,023)	(15,617,931)	(390,446,954)	(6,038,834)
Total All Funds	\$ 900,229,291	\$ 343,706,000 \$	91,695,208		\$	(1,700,427,974)				\$ (796,263,049)
		,,	, -, -, -, -, -, -, -, -, -, -, -, -,	,,,		(-, , ,)	. (= ==,=,=,=,, =) W	(,-,-,-,-,) 0	(=,,-,-,-,-,-,-,-,-,-,-,-,-,-,-,-,-,-	. (,200,0.0)

⁽a) Employer only contributions.

⁽b) Employee only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD SCHEDULE OF NON-INVESTMENT CHANGES BY FUND

(Supplement to the Treasury Division Report) For the Month Ended April 30, 2021

	Contributions						Net			
	Contributions EE and/or ER	State of Alaska	Other	Total Contributions		Benefits	Refunds & Disbursements	Administrative & Investment	Total Expenditures	Contributions/ (Withdrawals)
Public Employees' Retirement System (PERS)	EE did of ER	State of Maska	Other	Contributions		Belletits	Disoursements	æ mvestment	Expenditures	(Williamana)
Defined Benefit Plans:										
Retirement Pension Trust	\$ 31,246,360	\$ - \$	12,188 \$		\$	(77,606,624) \$	(694,212) \$		(78,859,276)	\$ (47,600,728)
Retirement Health Care Trust	5,423,251	-	1,817,787	7,241,038		(35,974,278)	-	(4,715,500)	(40,689,778)	(33,448,740)
Total Defined Benefit Plans	36,669,611	-	1,829,975	38,499,586		(113,580,902)	(694,212)	(5,273,940)	(119,549,054)	(81,049,468)
Defined Contribution Plans:										
Participant Directed Retirement	15,982,231	-	-	15,982,231		-	(5,796,618)	(703,210)	(6,499,828)	9,482,403
Health Reimbursement Arrangement (a)	4,124,120	=	-	4,124,120		(22,266)	-	(24,143)	(46,409)	4,077,711
Retiree Medical Plan (a)	1,600,599	=	3,880	1,604,479		(46,600)	-	(11,015)	(57,615)	1,546,864
Occupational Death and Disability: (a)										
All Others	328,486	-	-	328,486		(9,076)	-	(1,834)	(10,910)	317,576
Peace Officers and Firefighters	118,651	-	-	118,651		(27,351)	-	(1,982)	(29,333)	89,318
Total Defined Contribution Plans	22,154,087	<u> </u>	3,880	22,157,967		(105,293)	(5,796,618)	(742,184)	(6,644,095)	15,513,872
Total PERS	58,823,698	-	1,833,855	60,657,553		(113,686,195)	(6,490,830)	(6,016,124)	(126,193,149)	(65,535,596)
Teachers' Retirement System (TRS)										
Defined Benefit Plans:										
Retirement Pension Trust	5,020,410	-	242	5,020,652		(41,857,307)	(235,347)	(316,099)	(42,408,753)	(37,388,101)
Retirement Health Care Trust	2,042,792	-	673,710	2,716,502		(11,492,679)	-	(628,411)	(12,121,090)	(9,404,588)
Total Defined Benefit Plans	7,063,202	-	673,952	7,737,154		(53,349,986)	(235,347)	(944,510)	(54,529,843)	(46,792,689)
Defined Contribution Plans:										
Participant Directed Retirement	5,468,552	-	-	5,468,552		-	(1,153,650)	(298,956)	(1,452,606)	4,015,946
Health Reimbursement Arrangement (a)	1,078,579	-	-	1,078,579		(5,769)	-	(7,121)	(12,890)	1,065,689
Retiree Medical Plan (a)	349,866	-	589	350,455		(10,674)	-	(4,978)	(15,652)	334,803
Occupational Death and Disability (a)	29,127	-	-	29,127		(2,025)	-	(800)	(2,825)	26,302
Total Defined Contribution Plans	6,926,124	-	589	6,926,713		(18,468)	(1,153,650)	(311,855)	(1,483,973)	5,442,740
Total TRS	13,989,326	-	674,541	14,663,867	_	(53,368,454)	(1,388,997)	(1,256,365)	(56,013,816)	(41,349,949)
Judicial Retirement System (JRS)										
Defined Benefit Plan Retirement Pension Trust	656,835	_	-	656,835		(1,205,525)	-	(13,303)	(1,218,828)	(561,993)
Defined Benefit Plan Retirement Health Care Trust	68,096	-	17,947	86,043		(130,612)	-	(6,268)	(136,880)	(50,837)
Total JRS	724,931	-	17,947	742,878		(1,336,137)	-	(19,571)	(1,355,708)	(612,830)
National Guard/Naval Militia Retirement System (NGNMRS)										
Defined Benefit Plan Retirement Pension Trust (a)	_	_	_	_		(107,422)	_	(3,574)	(110,996)	(110,996)
						(107,122)		(5,571)	(110,550)	(110,550)
Other Participant Directed Plans										
Supplemental Annuity Plan (SBS)	13,900,053	-	-	13,900,053		-	(21,121,592)	(902,828)	(22,024,420)	(8,124,367)
Deferred Compensation Plan (b) (DCP)	2 225 010			2 225 010			(7.100.174)	(275.040)	(7.474.214)	(5.249.205)
Deterred Compensation Plan (DCP)	2,225,919	-	-	2,225,919		-	(7,199,174)	(275,040)	(7,474,214)	(5,248,295)
Total All Funds	89,663,927	-	2,526,343	92,190,270		(168,498,208)	(36,200,593)	-	(213,172,303)	(120,982,033)
Total Non-Participant Directed	52,087,172	-	2,526,343	54,613,515		(168,498,208)	(929,559)	(6,293,468)	(175,721,235)	(121,107,720)
Total Participant Directed	37,576,755	-	-	37,576,755		-	(35,271,034)	(2,180,034)	(37,451,068)	125,687
Total All Funds	\$ 89,663,927	s - s	2,526,343 \$	92,190,270	\$	(168,498,208) \$	(36,200,593)	s (8,473,502) \$	(213,172,303)	\$ (120,982,033)

⁽a) Employer only contributions.

⁽b) Employee only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD SCHEDULE OF NON-INVESTMENT CHANGES BY FUND

(Supplement to the Treasury Division Report)
For the Ten Months Ending April 30, 2021

PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND TYPE

<u>Type</u>	PERS DCR Plan	TRS DCR Plan	Supplemental Annuity Plan	Deferred Compensation	TOTAL	% of Total
Payment to Beneficiary	\$ 96,873	3 \$	- \$ 511,889	\$ 97,599	\$ 706,361	0.2%
Death Benefit	1,556,73	7 479,507	7 12,317,326	3,659,610	18,013,180	4.8%
Disability / Hardship	107,81	113,179	43,693	81,346	346,029	0.1%
Minimum Required Distribution	76,95	3 17,149	7,259,108	2,172,213	9,525,428	2.5%
Qualified Domestic Relations Order	785,360	5 267,711	5,005,937	726,813	6,785,827	1.8%
Separation from Service / Retirement	53,054,532	19,410,918	3 179,866,356	54,586,912	306,918,718	81.9%
Purchase of Service Credit	-	-	508,060	256,927	764,987	0.2%
CARES Act Distributions	-	-	28,010,134	3,758,359	31,768,493	8.5%
TOTAL	\$ 55,678,27	\$ 20,288,464	\$ 233,522,503	\$ 65,339,779	\$ 374,829,023	100.0%

PERS & TRS PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND VESTED PERCENTAGE

Vesting		PERS DCR Plan	 TRS DCR Plan	 TOTAL	% of Total
100% Vested	\$	48,844,416	\$ 18,310,178	\$ 67,154,594	88.4%
75% Vested		1,463,547	426,251	1,889,798	2.5%
50% Vested		1,481,220	360,668	1,841,888	2.4%
25% Vested		1,484,343	629,665	2,114,008	2.8%
0% Vested		2,404,752	561,701	2,966,453	3.9%
1	OTAL \$	55,678,277	\$ 20,288,464	\$ 75,966,741	100.0%

DEFINED BENEFIT REFUNDS BY PLAN, TIER, CONTRIBUTION TYPE AND VESTED STATUS

	PERS DB Pension Plan						TRS DB Pension Plan						JRS		TOTAL	
Contribution Type		Tier 1		Tier 2		Tier 3	 Total		Tier 1		Tier 2		Total	DB Pe	nsion Plan	DB Pension Plan
Mandatory Vested	\$	45,211	\$	350,506	\$	1,634,651	\$ 2,030,368	\$	60,162	\$	257,258	\$	317,420	\$	-	\$ 2,347,788.00
Mandatory Non-Vested		164,046		388,698		741,504	1,294,248		196,387		556,001		752,388		-	2,046,636
Geographic Differential		-		160,280		96,749	257,029		-		-		-		-	257,029
Voluntary Full		435,001		852,639		1,323,687	2,611,327		-		-		-		-	2,611,327
Indebtedness, Lagging & Partial		11,506		99,494		145,890	256,890		90		44,212		44,302		-	301,192
TOTAL	\$	655,764	\$	1,851,617	\$	3,942,481	\$ 6,449,862	\$	256,639	\$	857,471	\$	1,114,110	\$		\$ 7,563,972

Notes for the DRB Supplement to the Treasury Report

April 2021

This report is the DRB supplement to the Treasury Division's Financial Report. It expands the "Net Contributions/(Withdrawals)" column into contributions and expenditures. It shows contributions received from both employees and employers, contributions from the State of Alaska, and other non-investment income. This report also expands expenditures into benefits, refunds & disbursements, and administrative & investment expenditures.

The net amount of total contributions and total expenditures, presented as "Net Contributions/(Withdrawals)", agrees with the same column in the Treasury Division's Report. Page one shows the year-to-date totals for the first ten months of Fiscal Year 2021, while page two shows only the month of April 2021.

Highlights – On page one, for the ten months ending April 30, 2021:

- PERS DB Pension Average employer and employee contributions of \$31.2 million per month; benefit payments of approximately \$77 million per month;
 refunds average \$645 thousand; and administrative and investment expenditures of \$389 thousand per month (DOR and DRB).
- PERS DB Healthcare Average employer contributions of \$5.9 million per month; benefit payments of approximately \$37.6 million per month; other income of \$18.9 million from monthly OptumRx EGWP Subsidies; \$606 thousand from CMS-RDS; \$29 million from OptumRx Pharmacy Rebates (most recently received in March for 4th Quarter CY2020; \$508 thousand from Aetna Pharmacy Rebates (most recently received in March for 3rd Quarter CY2020); \$18.9 million from EGWP coverage gap discount plan (CGDP), (most recently received in January for 3rd Quarter CY2020); and average administrative and investment expenditures of \$2.1 million per month (DOR and DRB).
- PERS DC Pension Average employer and employee contributions of \$15.5 million per month; participant disbursements average \$5.6 million per month; and average administrative and investment expenditures of \$471 thousand per month (DOR and DRB).
- PERS DCR Health For HRA, RMP, and OD&D, only employer contributions average \$5.9 million per month on behalf of participating employees; benefit payments of approximately \$103 thousand per month. Currently, 14 benefits are being paid from the Occupational Death & Disability plans, 63 retirees are participating in RMP, and 89 retirees are participating in HRA. Other income of \$29 thousand from monthly OptumRx EGWP Subsidies; \$26 thousand from OptumRx Pharmacy Rebates (most recently received in March for 4th Quarter CY2020; \$14 thousand from EGWP coverage gap discount plan (CGDP), (most recently received in January for 3rd Quarter CY2020); and administrative and investment expenditures were approximately \$25 thousand per month (DOR and DRB).
- TRS DB Pension Average employer and employee contributions of \$4.8 million per month; benefit payments of approximately \$41.8 million per month; refunds average \$111 thousand; and average administrative and investment expenditures of \$209 thousand per month (DOR and DRB).
- TRS DB Healthcare Average employer contributions of \$1.8 million per month; benefit payments of approximately \$12 million per month; other income of \$6.8 million from monthly OptumRx EGWP Subsidies; \$199 thousand from CMS-RDS; \$9.4 million from OptumRx Pharmacy Rebates (most recently received in March for 4th Quarter CY2020); \$168 thousand from Aetna Pharmacy Rebates (most recently received in March for 3rd Quarter CY2020); \$6.3 million from EGWP coverage gap discount plan (CGDP), (most recently received in January for 3rd Quarter CY2020); and average administrative and investment expenditures of \$570 thousand per month (DOR and DRB).

- TRS DC Pension Average employer and employee contributions of \$5.1 million per month; participant disbursements average \$2 million per month; and average administrative and investment expenditures of \$175 thousand per month (DOR and DRB).
- TRS DCR Health For HRA, RMP, and OD&D only, employer contributions average \$1.4 million per month on behalf of participating employees; benefit payments of approximately \$34 thousand per month. Currently, 1 benefits are being paid from the Occupational Death & Disability plans, 19 retirees are participating in RMP, and 24 retirees are participating in HRA. Other income of \$3 thousand was received from monthly OptumRx EGWP Subsidies; and administrative and investment expenditures were approximately \$10 thousand per month (DOR and DRB).
- JRS Pension Average employer and employee contributions of \$556 thousand per month; benefit payments of approximately \$1.2 million per month; and average administrative and investment expenditures of \$10 thousand per month (DOR and DRB).
- JRS Healthcare Average employer contributions of \$58 thousand per month; benefit payments of approximately \$148 thousand per month. Other income of \$60 thousand from monthly OptumRx EGWP Subsidies; \$2 thousand from CMS-RDS; \$56 thousand from OptumRx Pharmacy Rebates (most recently received in February for 4th Quarter CY2020); \$63 thousand from EGWP coverage gap discount plan (CGDP) (most recently received in January for 3rd Quarter CY2020); and average administrative and investment expenditures of \$6 thousand per month (DOR and DRB).
- NGNMRS A combination of lump-sum and monthly benefit payments of \$135 thousand per month; and average administrative and investment expenditures of \$10 thousand per month (DOR and DRB).
- SBS Average employer and employee contributions and transfers in of \$14.1 million per month. Participant disbursements average of \$23.4 million per month; and average administrative and investment expenditures of \$724 thousand per month (DOR and DRB).
- Deferred Compensation Average member-only contributions and transfers in of \$3.7 million per month; participant disbursements average of \$6.5 million per month; and average administrative and investment expenditures of \$192 thousand per month (DOR and DRB).

Highlights – On page two, activity for the one month of April 2021 only:

- PERS DB Healthcare Other Income of \$1.8 million from OptumRx EGWP subsidies and CMS rebates.
- TRS DB Healthcare Other Income of \$673 thousand from OptumRx EGWP subsidies and CMS rebates.
- JRS DB Healthcare Other Income of \$17 thousand from OptumRx EGWP subsidies and CMS rebates.
- All other funds Nothing significant to report.

If you have any questions or comments, please let me know.

REPORT ON ALASKA RETIREE HEALTH PLAN ADVISORY BOARD MEETING MAY 14, 2021

Teladoc® for Retirees: In response to the COVID-19 outbreak, retiree plan members have been provided temporary access to general medical consultations through Teladoc®—a virtual care system offering telehealth visits with licensed health care providers for non-emergency conditions. After June 30, 2021, Teladoc® services will no longer be a temporary benefit available to retiree plan members.

The AlaskaCare retiree health plan will continue to cover telemedicine services delivered regular providers.

The following benefits are permanently available to all AlaskaCare members.

- **COVID-19 Testing:** If you receive laboratory tests to diagnose or treat COVID-19, AlaskaCare is waiving your deductible and coinsurance. To qualify, your laboratory tests must be deemed medically necessary under the terms of the plan and they must be FDA-approved.
- **COVID-19 Vaccines:** The AlaskaCare health plan covers the cost for FDA approved COVID-19 vaccines, subject to recognized charge, under both the medical and pharmacy plans, at any authorized site of care. AlaskaCare members receive the vaccine at no cost.

Expanded Preventive Coverage

AlaskaCare excludes most preventive services. Under 65 age members typically must pay out of pocket for the entire cost of those services. This is because they generally do not qualify for Medicare coverage and have AlaskaCare as their primary coverage.

Members over the age of 65 are less impacted by the lack of preventive coverage, because they are generally eligible for Medicare, which becomes their primary coverage. And their AlaskaCare becomes secondary coverage. Adding preventive coverage to the AlaskaCare retiree plan is less impactful to those eligible for Medicare benefits because Medicare offers many preventive services at little or no cost to the beneficiary.

The Division proposes adding two different member cost sharing options for preventive services to the Plan that mirror those provided in most employee plans in accordance with the Affordable Care Act. Adding coverage for preventive care services and screenings to the AlaskaCare defined benefit retiree health plan is anticipated to increase the use of preventive services and to support members in maintaining their health. The actuarial Impact is anticipated to be an increase 0.45% - 0.50%. The annual cost increase to the plan is expected to be \$3m - \$3.35m. If the retiree health care liabilities were not overfunded, in accordance with the Alaska Retirement Management Board's current funding policy, the total illustrative increases in the Fiscal Year 2023 Alaska State Contribution would be approximately \$2.0 - \$2.3 million

The annual cost increase associated with the proposed benefit additions will have long-term impacts to the healthcare Actuarial Accrued Liability and to the Additional State Contributions associated with the Plan. Current overfunded status of the retiree health care liabilities has eliminated the immediate need for amortization payments to offset any unfunded liability. It is important to note the that long-term funded status of the trusts is subject to change in response to market volatility and many other factors.

The Retiree Health Advisory Board Modernization Subcommittee is meeting June 18, 2021 to continue discussion of the expanded preventative care coverage proposal.

A	LASKA RETIREMENT MANA	GEMENT BOAF	RD
SUBJECT:	Certification of Actuarial Review	ACTION:	X
DATE:	June 17-18, 2021	INFORMATION:	
BACKGROUN	<u>D:</u>		
Board is responsit contains a req shall be reviewed presentation to t	a) (9) prescribes certain duties and reports that the sible for securing from a member of the American uirement that "the results of all actuarial assumed and certified by a second member of the American board."	can Academy of Actuarion ptions prepared under the	es. Additionally, his paragraph
defined benefit pPublic ETeachersJudicial	LC (Buck), the board's actuary, has completed a plans as of June 30, 2020: imployees' Retirement System (PERS) s' Retirement System (TRS) Retirement System (JRS) I Guard and Naval Militia Retirement System (N		ing four (4)
• PERS T	ng two (2) defined contribution plans as of June ier IV for Occupational Death & Disability and rr III for Occupational Death & Disability and R	Retiree Medical Benefit	
Gabriel Roeder	Smith & Company (GRS), the board's review a	actuary, has reviewed the	e valuation

 \mathbf{C} reports prepared by Buck and provided a draft letter and report describing a review of the above listed valuation reports.

GRS compiled and reviewed an audit findings list (incorporated in the report referenced above) setting out recommendations and suggestions from the GRS review reports for further discussion or action.

RECOMMENDATION:

That the Alaska Retirement Management Board accept the review and certification of FY 2020 actuarial reports by Gabriel Roeder Smith & Company.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Acceptance of Actuarial Valuation Reports	ACTION:	X	
	PERS / TRS DB & DCR, JRS, NGNMRS			
DATE:	June 17, 2021	INFORMATION:		

BACKGROUND:

AS 37.10.220(a)(8) prescribes that the Alaska Retirement Management Board (Board) "coordinate with the retirement system administrator to have an annual actuarial valuation of each retirement system prepared to determine system assets, accrued liabilities, and funding ratios and to certify to the appropriate budgetary authority of each employer in the system."

AS 37.10.220(a)(9) provides that "the results of all actuarial assumptions prepared under this paragraph shall be reviewed and certified by a second member of the American Academy of Actuaries before presentation to the Board."

STATUS:

Buck Global, LLC (Buck), the Department of Administration's and Plans' actuary, has completed and reviewed the following reports with the Board's Actuarial Committee on March 17 and June 16, 2021:

- 1) an actuarial valuation of the Public Employees' Retirement System as of June 30, 2020
- 2) an actuarial valuation of the Teachers' Retirement System as of June 30, 2020
- 3) an actuarial valuation of the Public Employees' Retirement System Defined Contribution Retirement Plan (for Occupational Death and Disability and Retiree Medical Benefits) as of June 30, 2020
- 4) an actuarial valuation of the Teachers' Retirement System Defined Contribution Retirement Plan (for Occupational Death and Disability and Retiree Medical Benefits) as of June 30, 2020
- 5) an actuarial valuation of the Judicial Retirement System (JRS) as of June 30, 2020
- 6) an actuarial valuation of the National Guard and Naval Militia Retirement System (NGNMRS) as of June 30, 2020

There are four assumption changes recommended and presented in the final reports:

- 1) DB retired member medical contributions for PERS and TRS were updated to reflect the 5% decrease from calendar year 2020 to 2021;
- 2) Healthcare claim costs are updated annually and described in Section 5.2 for the PERS and TRS DB and Section 4.2 for the PERS DCR and TRS DCR actuarial valuation reports. The potential impact of the ongoing COVID-19 pandemic on costs and liabilities was considered and an adjustment was made in setting the medical per capita claims cost assumption. FY20 medical claims were adjusted for a COVID-19 related decline in claims during the last four months (March June) of FY20. In addition, the 0.2% annual trend rate adjustment factor between the DB and DCR plans was removed, and the medical and prescription drug relative value factors for the DCR plans were updated;
- 3) The Normal Cost load for administrative expenses was updated based on the most recent two years of actual amounts paid from plan assets; and

4) The salary and pensioner benefit increase assumptions for JRS were changed to 0% for FY21-FY24.

Gabriel Roeder Smith & Company (GRS), the Board's actuary, has reviewed the listed actuarial valuations and provided their reports and audit findings to the Actuarial Committee and the Board.

RECOMMENDATION:

That the Alaska Retirement Management Board accept the actuarial valuation reports prepared by Buck for the Public Employees', Teachers', Public Employees' Defined Contribution (for Occupational Death and Disability and Retiree Medical Benefits), Teachers' Defined Contribution (for Occupational Death and Disability and Retiree Medical Benefits), Judicial, and National Guard and Naval Militia retirement systems as of June 30, 2020.

Callan

ARM

June 17, 2021

ARMB Board Meeting

Preliminary Investment Performance Periods Ended March 31, 2021

Steve Center, CFASenior Vice President

Paul Erlendson
Senior Vice President

Agenda

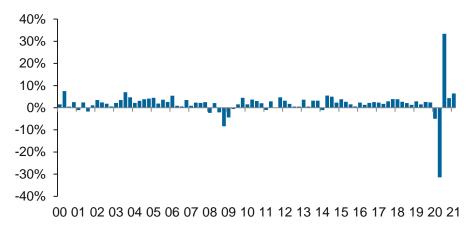
- Market and Economic Environment
- Total Fund Performance
 - Defined Benefit Plans' Major Asset Classes
 - Participant-Directed Plans



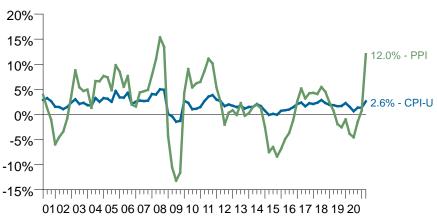
U.S. Economy—Summary

For periods ended 03/31/21

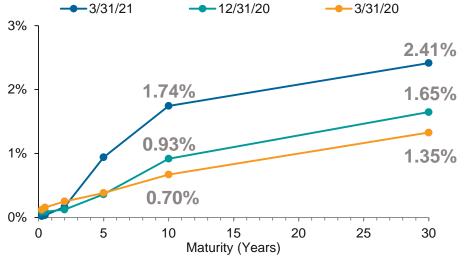
Quarterly Real GDP Growth*



Inflation Year-Over-Year



U.S. Treasury Yield Curves



*Preliminary estimate for 1Q21. Sources: Bloomberg, Bureau of Labor Statistics, Callan, IHS Markit

Historical 10-Year Yields



Market Environment: 1Q21

Growth worldwide with uncertainty coming from uneven vaccine rollout

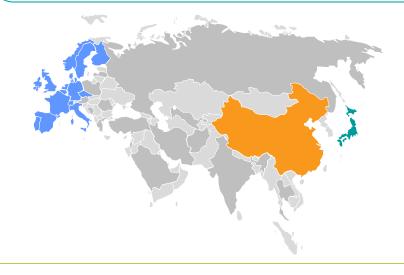
U.S.

- -2020 GDP loss of 3.5% for the year is the deepest recession in 75 years. Fed expects 6.5% growth in 2021.
- Retail sales, durable goods, and personal spending rebounded late in 2020 and 1Q21 following the vaccine announcement and passage of new stimulus.
- Unemployment dropped to 6.0% in March, with an eyepopping 916,000-job gain.
 - Jobless claims decelerated to less than 1 million per week but are still elevated relative to prior recession peaks.
- Housing benefiting from relatively low mortgage rates
- Fed left rates close to 0% and expects to be on hold until 2023.

Global

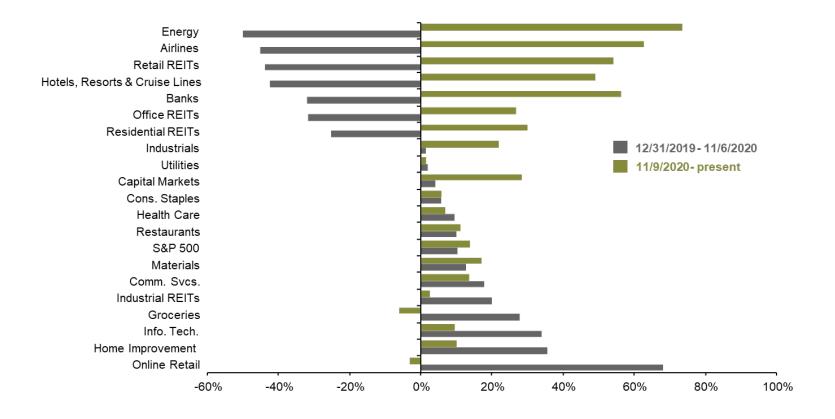
- Euro zone GDP contracted 4.9% in 2020, after shrinking by 2.4% in 2019.
- U.K. GDP sank 7.3% in 2020—most ever, struck by the double-whammy of the pandemic and Brexit.
- Japan's economy shrank 4.8% in 2020, continuing a decline that began in 4Q19.
- China's GDP grew 2.3% in 2020, one of the few countries to see positive growth. 1Q21 growth inched up just 0.6%, far below expectations.





U.S. Stock Market Sector Leadership Through the Pandemic

COVID trade flipped to a 'GDP growth trade' with the announcement of vaccines in November



Best-performing sectors employ far fewer workers than many of the underperforming sectors (health care, capital markets, banks, hospitality, transportation, energy).

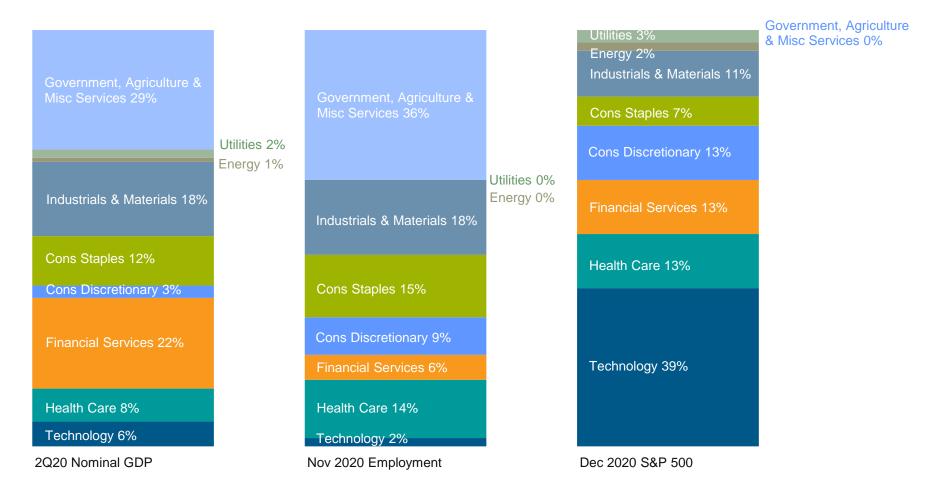
Source: FactSet, Standard & Poor's, J.P. Morgan Asset Management. Nov. 6, 2020, chosen as the last business day before vaccine candidate is revealed to have more than 90% efficacy against the COVID-19 virus in global trials.

Guide to the Markets – U.S. Data are as of March 31, 2021.



The Stock Market Is Not the Economy

Sector share of GDP, employment, and S&P 500

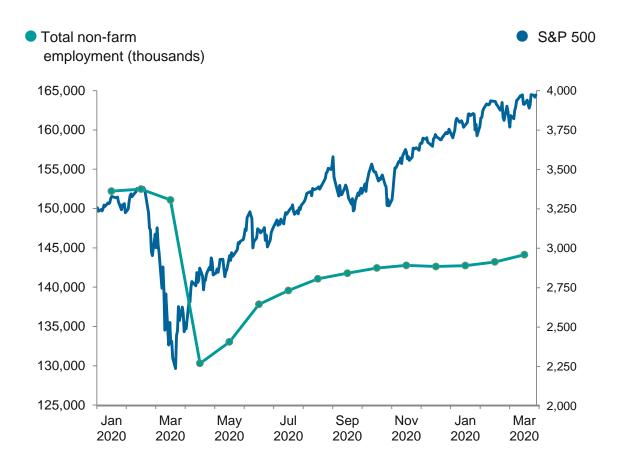


Sources: Bureau of Economic Analysis, Bureau of Labor Statistics, S&P Dow Jones Indices, J.P. Morgan Asset Management Guide to the Markets – U.S. Data are as of 12/31/20. Technology: information (economy, employment), technology and communication services (S&P 500). Financial services includes real estate (S&P 500). Consumer discretionary: Arts, entertainment, recreation, accommodation, and food services (economy), leisure and hospitality (employment). Consumer staples: wholesale trade and retail trade (economy, employment). Industrials and materials: construction, manufacturing, transportation and warehousing (economy, employment). Energy: mining (economy), mining and logging (employment). Government, agriculture & misc. services: government, other services, professional and business services, and education (employment).



The Stock Market Is Not the Economy

- U.S. equity market has already recovered from the March 2020 plunge. Large cap (S&P 500) is up 56% year-over-year; small cap (Russell 2000) is up 95%.
- U.S. job market created 22.8 million jobs in the decade from Feb 2010 – Feb 2020. The job market lost over 22.4 million jobs in March and April, and has recovered just 13 million since May.
- GDP is projected to regain the February 2020 pre-COVID peak in mid- to late 2021.
- Steep structural challenges face many jobladen sectors of the economy that are underrepresented in the current stock market valuation.
- Containment of COVID-19 surges and rollout of the vaccines are key to retaining confidence in the recovery.



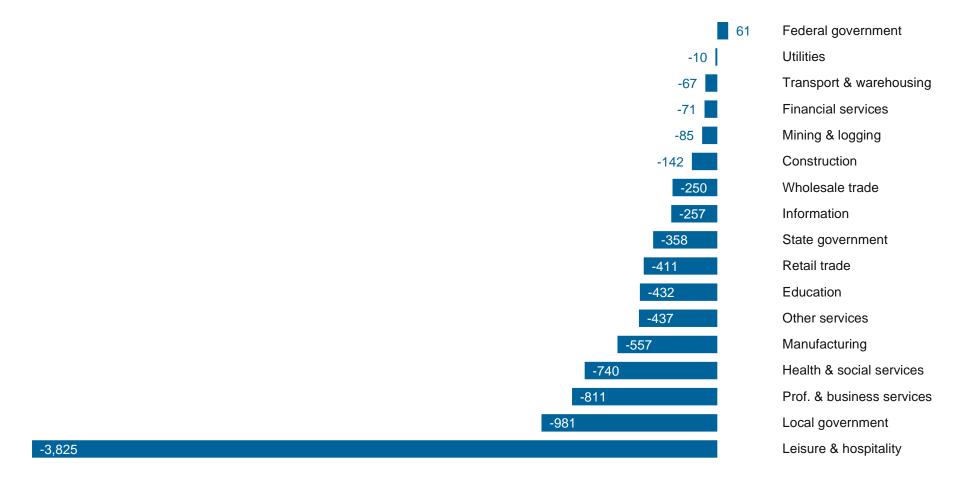
Sources: St. Louis FRED, S&P Dow Jones Indices



While the Recovery Continues, Employment Landscape Remains Depressed

Leisure/hospitality remains by far the hardest-hit sector for job losses

12-Month Change in Payroll Employment (thousands)

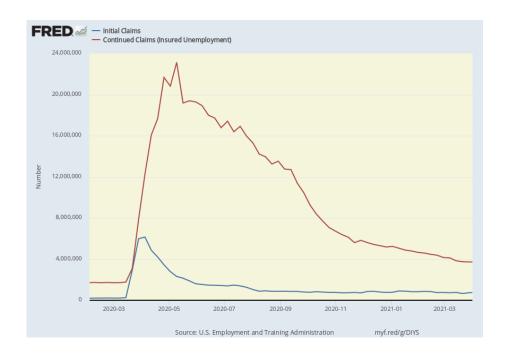


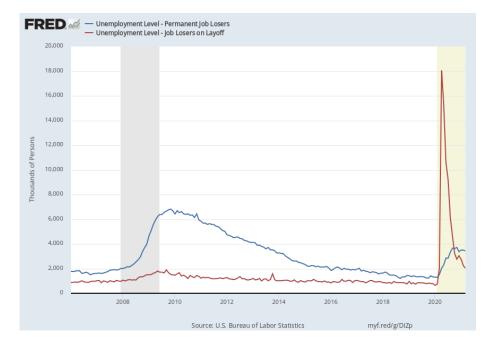
Sources: IHS Markit, Department of Labor



U.S. Job Market

Initial claims, total unemployed





- Spike in initial claims to over 6 *million* per week in April 2020
- -Remain stubbornly high at 730,000 at the end of March 2021
 - Far above prior periods of stress
 - -665,000 in March 2009
- Job increases (>13 million) surprised on the upside during 2020 and 1Q21; still 9.5 million lost jobs to be regained.
- According to the BLS, the number of job openings in the US reached an all-time high of 8.1 million as of 3/31/2021.

- Permanent job losses have accumulated, but at a much lower level than during the GFC.
- Substantial state and federal unemployment aid has led many workers to believe their jobs will be restored, if not their actual job then one like it in the same industry.
- The number of people seeking work did not spike with the surge in layoffs as in previous downturns, supporting this expectation that layoffs were temporary.

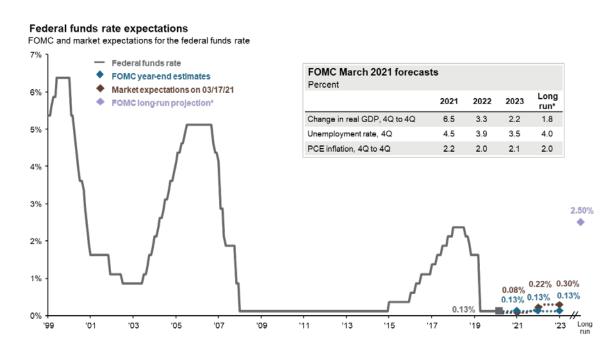
Sources: Federal Reserve, Department of Labor. Note: regular state unemployment programs exclude Federal programs such as Pandemic Unemployment Assistance



Government Intervention

Monetary policy expected to remain loose for some time

- The Federal Reserve Open Market
 Committee voted to continue 0% Fed Funds
 Rate and "sizeable asset purchases" at
 March meeting.
- Median FOMC member forecast expects zero interest rate policy through at least 2022.
- Powell: "Fed will continue to provide the economy the support it needs for as long as it takes."
- Fed confirms a new inflation targeting regime, with willingness to overshoot target to get desired outcome of 2%.
- Markets do not expect the Fed to raise the rate in the near future.
- "Longer run" projection remains at 2.5% for Fed Funds Rate, but it has no specific anchor date.



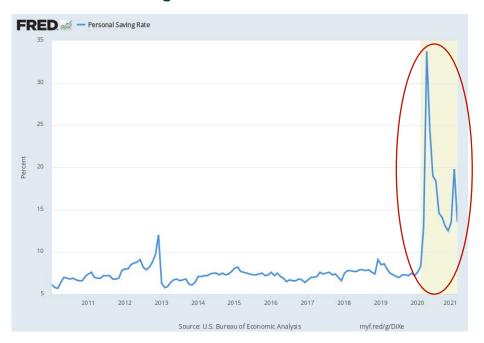




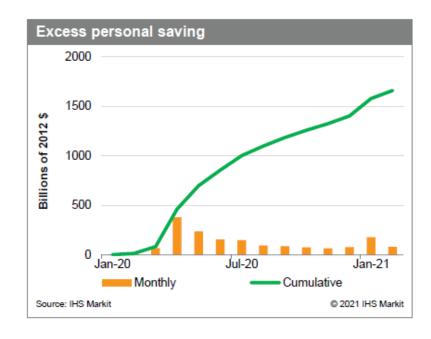
Liquidity Supporting Economy (and Driving Markets)

Consumers = more money, fewer problems; investors = dry powder abundant

U.S. Personal Savings Rate



Excess Personal Saving



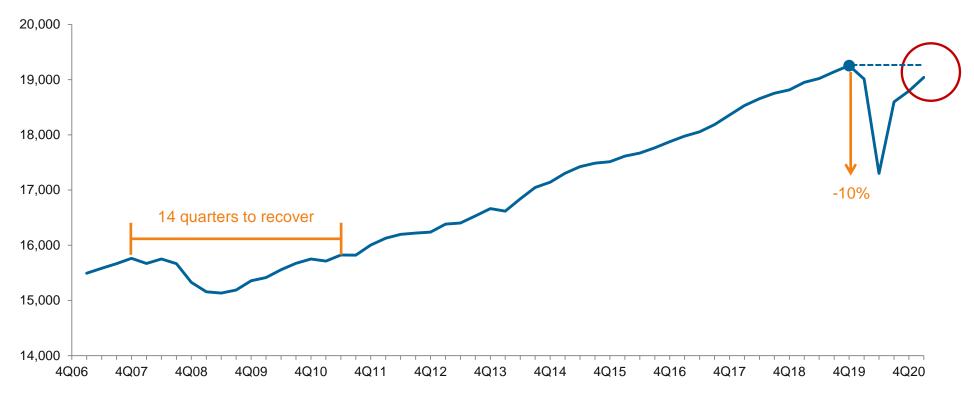
- U.S. personal savings rate far exceeds levels seen in the post-WWII era; shot up to 34% last April, spiked again to 20% with new lockdowns imposed at the end of 2020.
- Savings usually FALLS in a recession. Disposable income rose under congressional pandemic relief measures, and state and local government restrictions on activities hindered spending.
- Excess savings will insulate consumer spending during economic wobbles and through the winding down of fiscal stimulus.
- Rapid depletion of excess savings could goose GDP and spur short-term inflation; consumer theory and experience following WWII suggests a modest increase in consumption.

Excess savings = savings in excess of the 7.4% average savings rate for the year prior to the pandemic; calculation performed by IHS Markit Sources: Federal Reserve, IHS Markit



GDP Will Recover Pre-Pandemic Level in 2021 After Deepest Drop in 75 Years

Seasonally Adjusted Real GDP in Billions of Dollars



- After the Global Financial Crisis, it took 3.5 years before real GDP reclaimed its pre-recession highs.
- GFC peak to trough was down 4%.
- -2Q20 real GDP level was down over 10% from 4Q19, annual GDP declined 3.5% over 2019.
- -Second half 2020 GDP rose 8.6%; GDP at end of 4Q20 was down only 2.4% from the level set in 4Q19.
- Pre-pandemic peak level of GDP likely to be reached in 2Q21 (forecast by IHS Markit)

Source: St. Louis FRED. 1Q21 is an estimate from IHS Markit

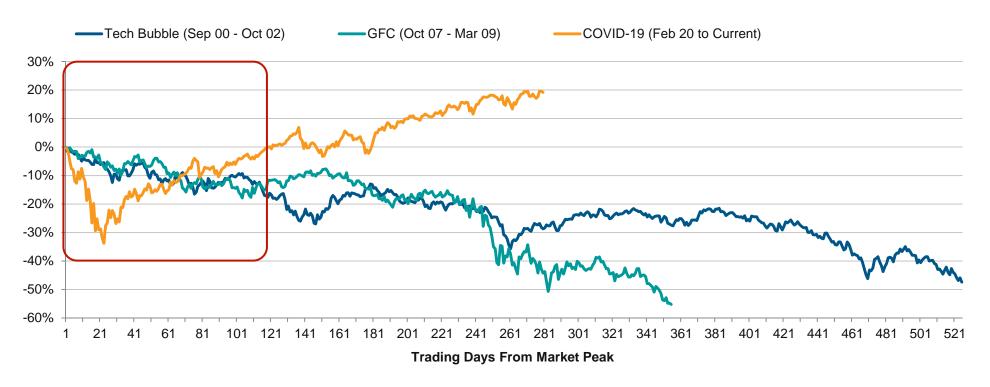


Unprecedented Shock to Global Capital Markets—Is It Really Over?

V-shaped recovery in equity—back in black by mid-August, up 81% from market bottom!

S&P 500 Cumulative Returns

Market Peak-to-Trough for Recent Corrections vs. Current Path of COVID-19 Correction Through 03/31/21



Sharpest and fastest equity market decline ever: 16 trading days to reach bear market; -33% after just 23 days

- Incredible rebound in U.S. equity market in 2020 and into 2021
 - -S&P 500 recovered all of its COVID-19 related losses by Aug. 10, only 97 days from the bottom
- -81% return from the market bottom through March 31, 2021
- -Up 18.4% for 2020

Sources: Callan. S&P Dow Jones Indices



Callan Periodic Table of Investment Returns

			A	nnual Retur	ns					Monthly	Returns	
2012	2013	2014	2015	2016	2017	2018	2019	2020	Jan 2021	Feb 2021	Mar 2021	YTD 2021
Real Estate	Small Cap Equity	Real Estate	Large Cap Equity	Small Cap Equity	Emerging Market Equity	U.S. Fixed Income	Large Cap Equity	Small Cap Equity	Small Cap Equity	Small Cap Equity	Large Cap Equity	Small Cap Equity
27.73%	38.82%	15.02%	1.38%	21.31%	37.28%	0.01%	31.49%	19.96%	5.03%	6.23%	4.38%	12.70%
Emerging Market Equity	Large Cap Equity	Large Cap Equity	U.S. Fixed Income	High Yield	Dev ex-U.S. Equity	High Yield	Small Cap Equity	Large Cap Equity	Emerging Market Equity	Real Estate	Real Estate	Large Cap Equity
18.23%	32.39%	13.69%	0.55%	17.13%	24.21%	-2.08%	25.52%	18.40%	3.07%	3.70%	2.85%	6.17%
Dev ex-U.S. Equity	Dev ex-U.S. Equity	U.S. Fixed Income	Real Estate	Large Cap Equity	Large Cap Equity	Global ex-U.S. Fixed Income	Dev ex-U.S. Equity	Emerging Market Equity	High Yield	Large Cap Equity	Dev ex-U.S. Equity	Real Estate
16.41%	21.02%	5.97%	-0.79%	11.96%	21.83%	-2.15%	22.49%	18.31%	0.33%	2.76%	2.55%	5.80%
Small Cap Equity	High Yield	Small Cap Equity	Dev ex-U.S. Equity	Emerging Market Equity	Small Cap Equity	Large Cap Equity	Real Estate	Global ex-U.S. Fixed Income	U.S. Fixed Income	Dev ex-U.S. Equity	Small Cap Equity	Dev ex-U.S. Equity
16.35%	7.44%	4.89%	-3.04%	11.19%	14.65%	-4.38%	21.91%	10.11%	-0.72%	2.55%	1.00%	4.04%
Large Cap Equity	Real Estate	High Yield	Small Cap Equity	Real Estate	Global ex-U.S. Fixed Income	Real Estate	Emerging Market Equity	Dev ex-U.S. Equity	Real Estate	Emerging Market Equity	High Yield	Emerging Market Equity
16.00%	3.67%	2.45%	-4.41%	4.06%	10.51%	-5.63%	18.44%	7.59%	-0.81%	0.76%	0.15%	2.29%
High Yield	U.S. Fixed Income	Emerging Market Equity	High Yield	Dev ex-U.S. Equity	Real Estate	Small Cap Equity	High Yield	U.S. Fixed Income	Large Cap Equity	High Yield	U.S. Fixed Income	High Yield
15.81%	-2.02%	-2.19%	-4.47%	2.75%	10.36%	-11.01%	14.32%	7.51%	-1.01%	0.37%	-1.25%	0.85%
U.S. Fixed Income	Emerging Market Equity	Global ex-U.S. Fixed Income	Global ex-U.S. Fixed Income	U.S. Fixed Income	High Yield	Dev ex-U.S. Equity	U.S. Fixed Income	High Yield	Global ex-U.S. Fixed Income	U.S. Fixed Income	Emerging Market Equity	U.S. Fixed Income
4.21%	-2.60%	-3.08%	-6.02%	2.65%	7.50%	-14.09%	8.72%	7.11%	-1.03%	-1.44%	-1.51%	-3.37%
Global ex-U.S. Fixed Income		Dev ex-U.S. Equity	Emerging Market Equity	Global ex-U.S. Fixed Income	U.S. Fixed Income	Emerging Market Equity	Global ex-U.S. Fixed Income	Real Estate	Dev ex-U.S. Equity	Global ex-U.S. Fixed Income	Global ex-U.S. Fixed Income	
4.09%	-3.08%	-4.32%	-14.92%	1.49%	3.54%	-14.57%	5.09%	-9.04%	-1.07%	-1.94%	-2.42%	-5.29%

Sources:

Bloomberg Barclays Aggregate

Bloomberg Barclays Corp High Yield

Bloomberg Barclays Global Aggregate ex US

[●] FTSE EPRA Nareit Developed ● MSCI World ex USA ● MSCI Emerging Markets ● Russell 2000 ● S&P 500



Continued Surge in Global Equity Markets in 1Q21

Small cap leads in both U.S. and global ex-U.S. markets

Global equity continued to surge in 1Q

- Year-over-year returns from the bottom of the pandemic market crash are eye-popping:
 - S&P 500: +56%
 - MSCI World ex-USA: +46%
 - Emerging Markets: +58%
 - U.S. Small Cap: +95% (!)
- The initial recovery was concentrated in a few stocks (FAANG) and U.S. mega cap.
- Market rotation to small cap and value with the flip from a "COVID trade" to a "GDP growth trade" in November, with the announcement of vaccines
- As COVID-19 infections surged in the new year, re-openings were reversed in many states and localities, but only temporarily.
- Economic recovery now looking very strong in 2021, into 2022. Fed projects GDP growth of 6.5% in 2021.
- Distribution challenges have kept widespread inoculation from being achieved until mid-year in the U.S.; it could be much later in countries around the globe.

Returns for Periods ended 3/31/21

	1 Quarter	1 Year	5 Years	10 Years	25 Years
U.S. Equity					
Russell 3000	6.35	62.53	16.64	13.79	9.71
S&P 500	6.17	56.35	16.29	13.91	9.59
Russell 2000	12.70	94.85	16.35	11.68	9.36
Global ex-U.S. Equity					
MSCI World ex USA	4.04	45.86	8.92	5.21	5.21
MSCI Emerging Markets	2.29	58.39	12.07	3.65	
MSCI ACWI ex USA Small Cap	5.53	69.82	10.40	6.32	6.51
Fixed Income					
Bloomberg Barclays Aggregate	-3.37	0.71	3.10	3.44	5.09
90-day T-Bill	0.03	0.12	1.19	0.63	2.22
Bloomberg Barclays Long Gov/Credit	-10.41	-2.05	5.47	6.98	7.22
Bloomberg Barclays Global Agg ex-US	-5.29	7.15	2.13	1.26	3.80
Real Estate					
NCREIF Property	1.72	2.61	5.81	8.82	9.06
FTSE Nareit Equity	8.87	37.78	5.33	8.56	9.92
Alternatives					
CS Hedge Fund	2.85	20.19	5.12	3.88	7.20
Cambridge Private Equity*					
Bloomberg Commodity	6.92	35.04	2.31	-6.28	0.97
Gold Spot Price	-9.47	7.45	6.78	1.77	6.01
Inflation - CPI-U	1.69	2.62	2.15	1.71	2.15

^{*}Cambridge PE data through 09/30/20 Sources: Bloomberg, Bloomberg Barclays, Callan, Cambridge, Credit Suisse, FTSE Russell, MSCI, NCREIF, S&P Dow Jones Indices



U.S. Equity Performance: 1Q21

New market peaks in year of the pandemic

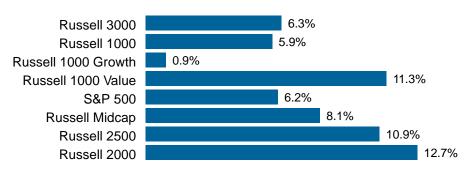
Markets continue setting all-time highs

- The S&P 500 Index hit record highs in 1Q21, gaining 6.2%.
 - Since the prior peak (February 2020) the S&P is up over 19.6%, with only Energy (-4.7%) and Utilities (-4.9%) declining from peak-to-peak.
 - Since March 2020 market low, S&P up over 80.7%, with all sectors posting gains over 40%; Energy +116.2%
 - 1Q21 top sectors were Energy and Financials, while Industrials and Consumer Staples underperformed.
 - "Re-opening" sectors (airlines, retail REITs, hospitality) outperformed while "work from home" sectors (online retail, home improvement) lagged.

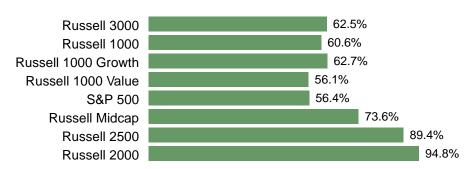
Value and small cap trends continue through 1Q21

- Value outperformed growth across the market cap spectrum.
- Small caps outperformed large in 1Q.
- Small value was the top-performing asset class for the quarter (+21.2%) and from the March 2020 low (+127.7%).

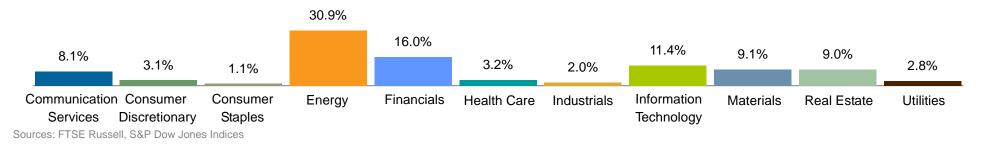
U.S. Equity: Quarterly Returns



U.S. Equity: One-Year Returns



Industry Sector Quarterly Performance (S&P 500)



Global ex-U.S. Equity Performance: 1Q21

Nearly 100 million people fully vaccinated worldwide

- Markets responded positively to the global rollout of the COVID-19 vaccine.
- Most risk assets continued to outperform as global businesses reopen.
- Small cap outperformed large over the quarter on continued economic optimism.
- Emerging markets trailed developed markets; COVID-19 outbreaks and vaccination challenges hindered EM results.

Market continues to favor cyclicals

- Sustained market recovery and rising interest rates buoyed cyclical stocks; Energy, Financials, and Industrials drove the market.
- Factor performance showed a preference for beta and volatility, similar to 4Q20.

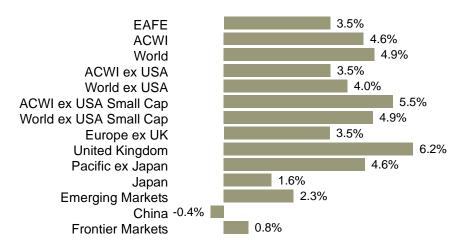
U.S. dollar vs. other currencies

 The U.S. stimulus package announcement, combined with yields rising on economic confidence, fueled the U.S. dollar.

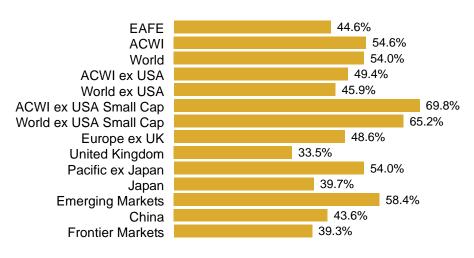
Growth vs. value

Value outpaced growth for the second consecutive quarter.

Global Equity: Quarterly Returns



Global Equity: One-Year Returns



Source: MSCI



U.S. Fixed Income Performance: 1Q21

The U.S. Treasury yield curve steepens

- The 10-year U.S. Treasury yield closed 1Q21 at 1.74%, up 81 bps from 4Q20.
- The short-end of the curve remained anchored, with no rate hikes expected until at least 2023, steepening the yield curve.
- TIPS outperformed nominal U.S. Treasuries as 10-year breakeven spreads widened from 1.99% to 2.37%.

Bloomberg Barclays Aggregate falls

- The Bloomberg Barclays US Aggregate Bond Index dropped 3.4%, with spread sectors outperforming treasuries.
- Demand for corporate credit remains strong, and spreads did not change meaningfully over the quarter

High yield bonds gain as rally extended

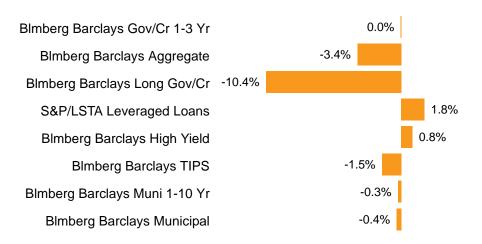
- High yield (HY) bonds outperformed investment grade (IG) in 1Q, gaining 0.8% amid a wave of new issuance.
- Leveraged loans rose 1.8% during the quarter, driven by favorable supply/demand dynamics, floating rate coupons, and relatively short durations.

Munis boosted by stimulus

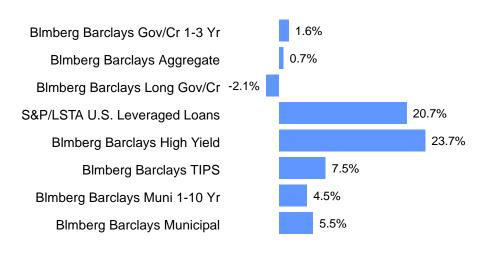
- Municipals outperformed treasuries for the quarter, as municipal yields rose less than treasury yields.
- The municipal market was supported by the American Rescue Act.

Source: Bloomberg Barclays

U.S. Fixed Income: Quarterly Returns



U.S. Fixed Income: One-Year Returns





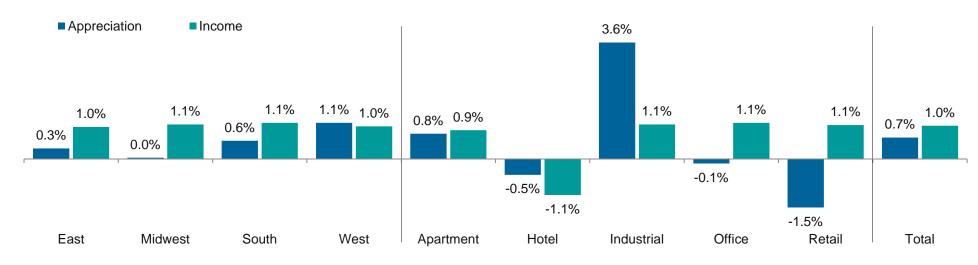
U.S. Private Real Estate Market Trends

Results

- Hotel and Retail are the most challenged sectors while Office faces uncertainty;
 Industrial remains the best performer.
- Income remains positive except in Hotel sector.
- Appraisers have more certainty on pandemic's impact on valuations.
- Return dispersion by manager within the ODCE Index due to composition of underlying portfolios

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
NCREIF ODCE	1.9%	1.5%	4.0%	5.3%	8.7%
Income	0.8%	3.0%	3.2%	3.3%	3.7%
Appreciation	1.1%	-1.5%	0.8%	1.9%	4.8%
NCREIF Property Index	1.7%	2.6%	4.9%	5.9%	9.0%
Income	1.0%	4.1%	4.4%	4.5%	5.0%
Appreciation	0.7%	-1.5%	0.5%	1.3%	3.7%

NCREIF Property Index Returns by Region and Property Type

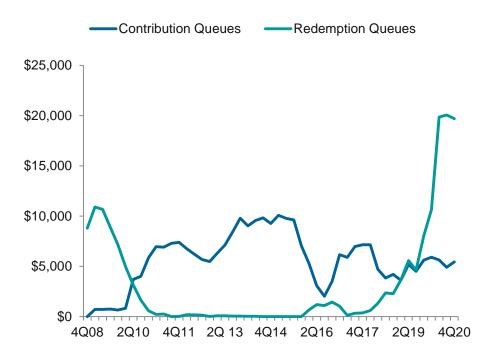


Source: NCREIF

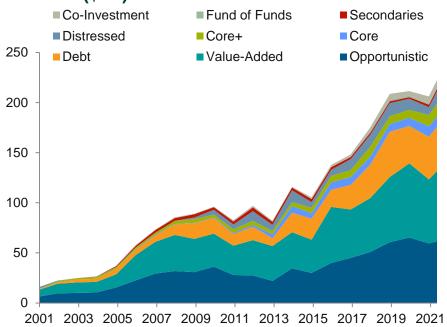


U.S. Private Real Estate Market Trends

Core Fund Contribution/Redemption Queues (\$bn)



Dry Powder Available for CRE investment in North America (\$bn)



- -U.S. core open end funds have investment queues of roughly \$5 billion and exit queues of \$20 billion
- ->\$200 billion of capital waiting to be deployed in North America
- Majority of dry powder capital in opportunistic, value-add, and debt funds



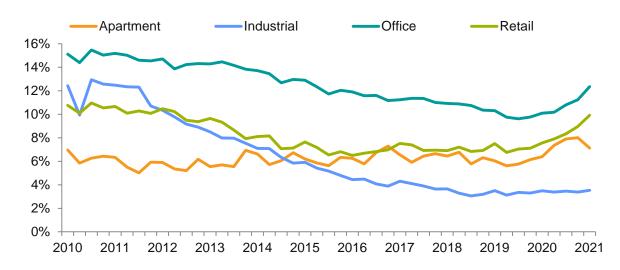
Sources: NCIF, Preqin

U.S. Private Real Estate Market Trends

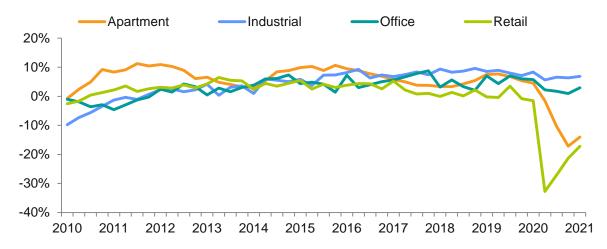
U.S. real estate fundamentals

- Vacancy rates for all property types are or will be impacted.
- Net operating income has declined as retail continues to suffer.
- 1Q21 rent collections showed relatively stable income throughout the quarter in the Industrial, Apartment, and Office sectors.
 The Retail sector remains challenged, with regional malls impacted most heavily.
- Class A/B urban apartments were relatively strong, followed by Industrial and Office.
- Supply was in check before the pandemic.
- New construction of preleased industrial and multifamily is occurring.

Vacancy by Property Type



Rolling 4-Quarter NOI Growth by Property Type



Source: NCREIF

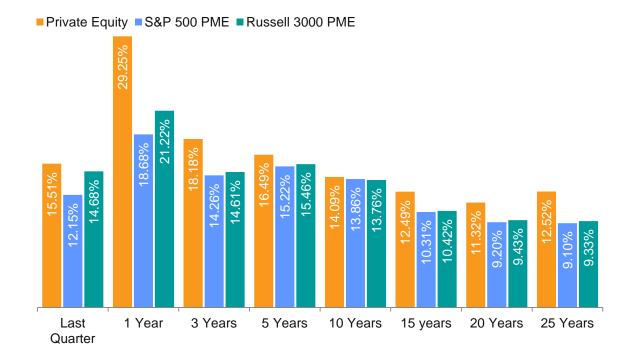


Private Equity Performance

Gains YTD, outpacing public equity

- Private equity 4Q20 gains ahead of those of public equity
- Private equity performance positive for 2020, notably outperforming public equity
- Private equity ahead of public equity across all longer-term time horizons, although only marginally over the last 10 years

Net IRRs as of 12/31/20



Source: Refinitiv/Cambridge

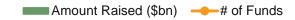


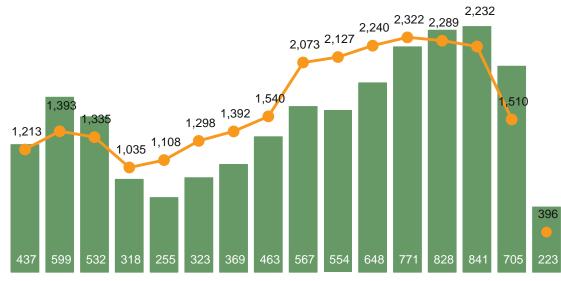
Private Equity Global Fundraising

Slowdown during pandemic

- Fundraising for 2020 at 84% of 2019 levels
- Many fundraises pushed out to 2021 due to worries over investor appetite and inability of funds to deploy capital during the onset of the pandemic
- Fundraising off to a strong start in 1Q21, and may reach a new high in 2021 if it continues on the same trajectory

Annual Fundraising



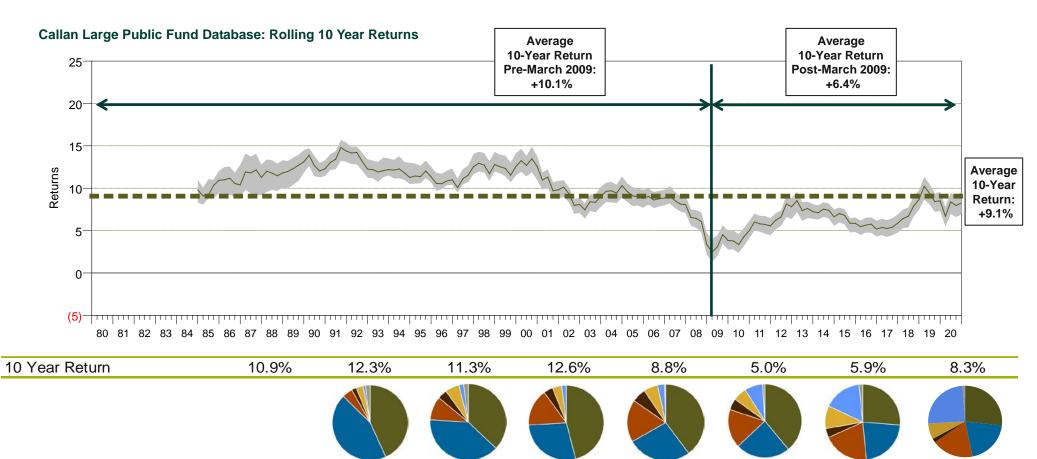


2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 1Q21 YTD





Historical Large Public Fund Asset Allocation and Nominal Returns

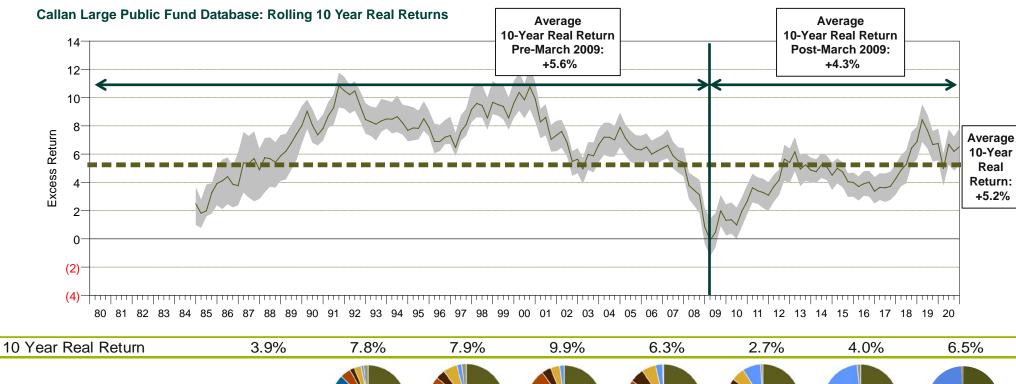


Asset Class	1985	1990	1995	2000	2005	2010	2015	2020
Domestic Equity	N/A	43%	37%	46%	40%	39%	26%	27%
Domestic Fixed Income		44%	39%	28%	27%	24%	22%	20%
Non-U.S. Equity		5%	10%	16%	18%	17%	20%	18%
Non-U.S. Fixed Income		2%	4%	4%	6%	5%	4%	2%
Real Estate		3%	6%	4%	6%	6%	10%	7%
Other Alternatives		1%	2%	2%	3%	8%	16%	25%
Cash Equivalents		2%	2%			1%	2%	1%

Allocations are as of December 31 of the applicable year.



Historical Large Public Fund Asset Allocation and Real Returns



10 Teal Netalli	2.170 4.070 0.070

Asset Class	1985	1990	1995	2000	2005	2010	2015	2020
Domestic Equity	N/A	43%	37%	46%	40%	39%	26%	27%
Domestic Fixed Income		44%	39%	28%	27%	24%	22%	20%
Non-U.S. Equity		5%	10%	16%	18%	17%	20%	18%
Non-U.S. Fixed Income		2%	4%	4%	6%	5%	4%	2%
Real Estate		3%	6%	4%	6%	6%	10%	7%
Other Alternatives		1%	2%	2%	3%	8%	16%	25%
Cash Equivalents		2%	2%			1%	2%	1%

Allocations are as of December 31 of the applicable year.

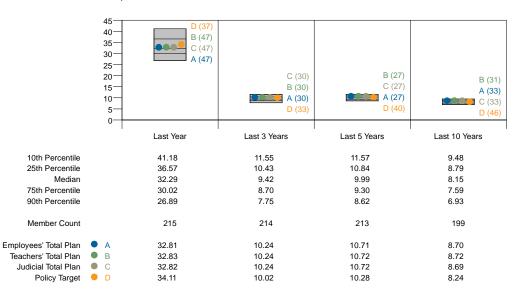


Callan

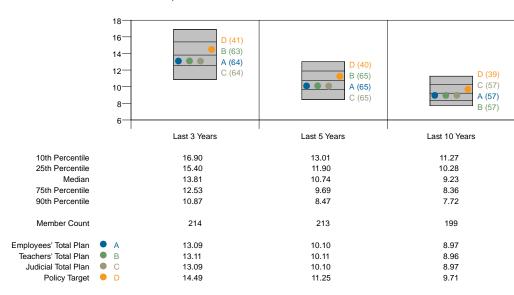
Pension Plan

PERS, TRS, and JRS Performance Dashboard – March 31, 2021

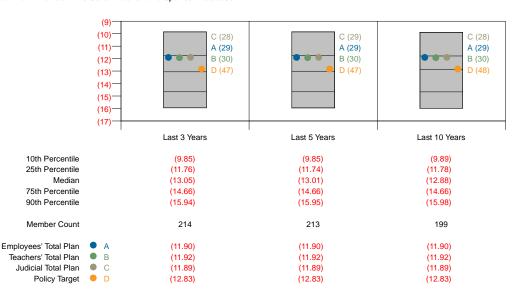
Returns vs Callan Public Fund Sponsor Database



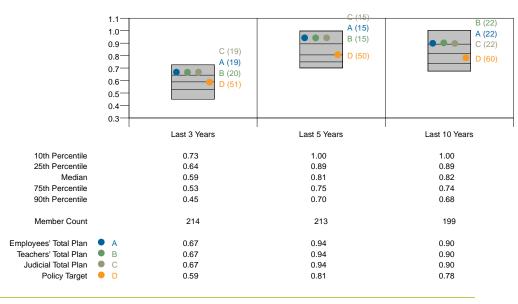
Standard Deviation vs Callan Public Fund Sponsor Database



Maximum Drawdown vs Callan Public Fund Sponsor Database



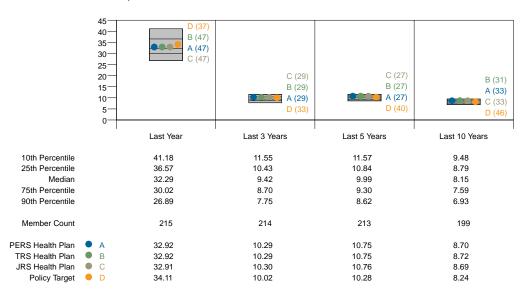
Sharpe Ratio vs Callan Public Fund Sponsor Database



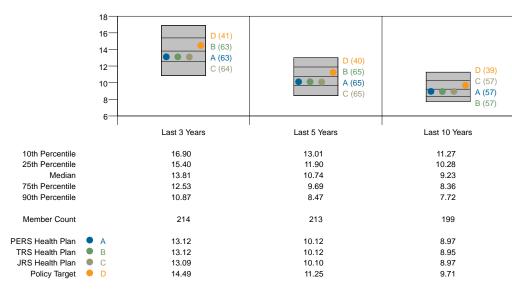


Health Care Plans Performance Dashboard - March 31, 2021

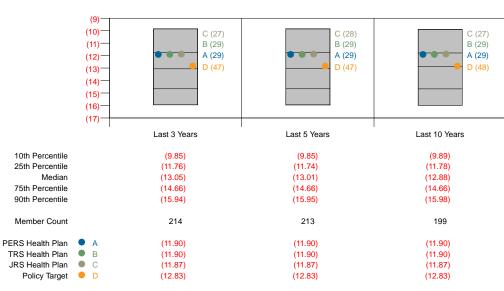
Returns vs Callan Public Fund Sponsor Database



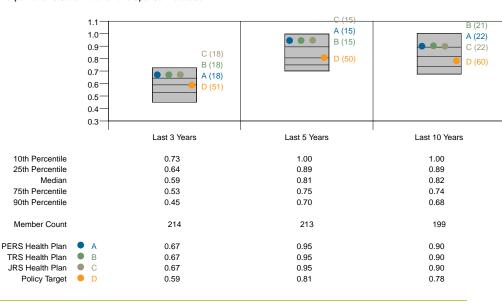
Standard Deviation vs Callan Public Fund Sponsor Database



Maximum Drawdown vs Callan Public Fund Sponsor Database



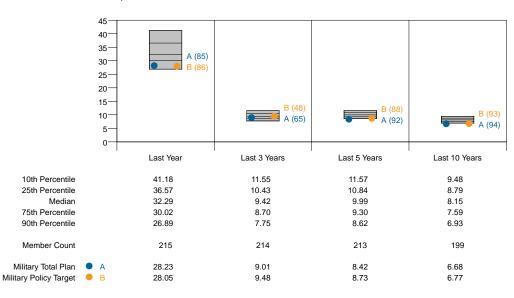
Sharpe Ratio vs Callan Public Fund Sponsor Database



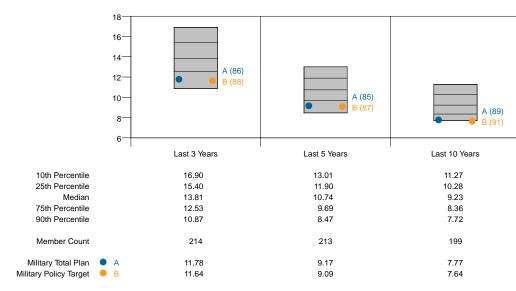


Military Plan Performance Dashboard - March 31, 2021

Returns vs Callan Public Fund Sponsor Database



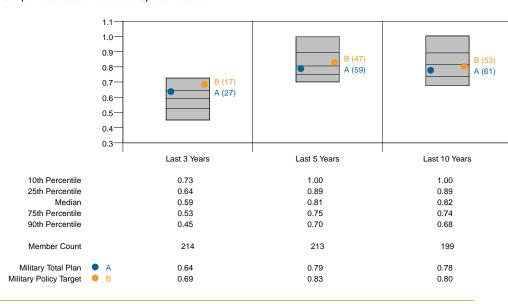
Standard Deviation vs Callan Public Fund Sponsor Database



Maximum Drawdown vs Callan Public Fund Sponsor Database

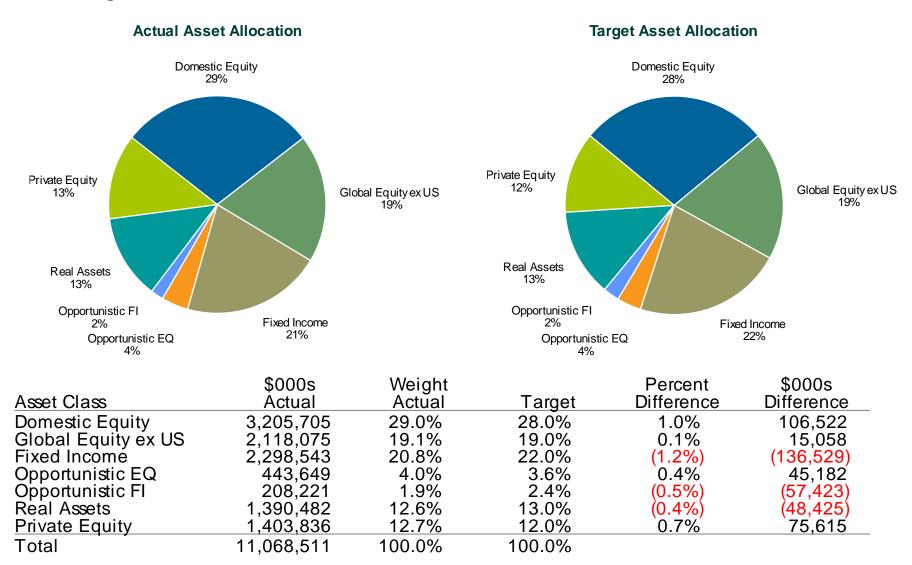


Sharpe Ratio vs Callan Public Fund Sponsor Database



Asset Allocation – Public Employees' Retirement System

Quarter Ending March 31, 2021



PERS is used as illustrative throughout the presentation.

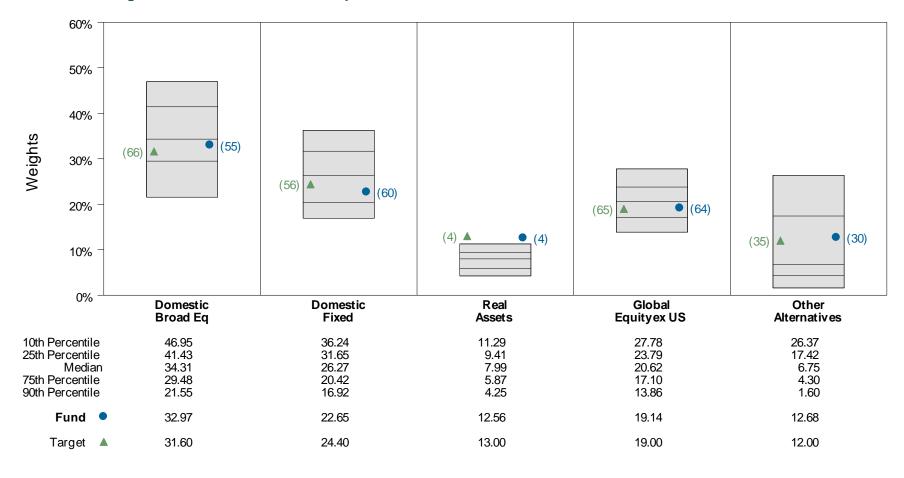
The other plans exhibit similar modest and understandable variations from strategic target allocations.



Asset Allocation vs. Public Funds (PERS)

Callan Public Fund Database

Asset Class Weights vs Callan Public Fund Sponsor Database



- Asset class allocations are in line with targets after the recent asset allocation update and associated rebalancing.
- Weightings to real assets and alternatives are relatively high in comparison to other public funds.

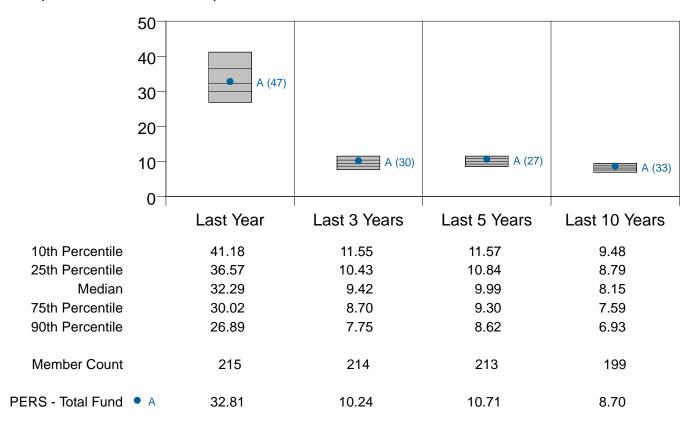
Notes: Real Assets includes Private Real Estate, REITs, Farmland, Timber, Energy, and Infrastructure. Other Alternatives represents private equity.



Total Fund Return vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Returns for Periods Ended March 31, 2021



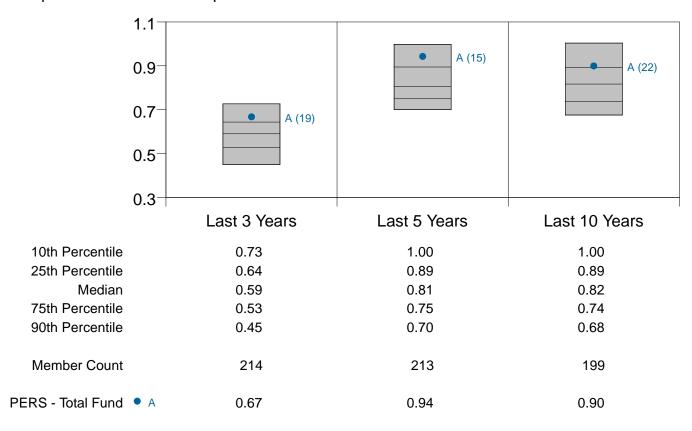
- Despite the recent change to the asset allocation, longer-term performance reflects ARMB's prior orientation toward capital growth as opposed to income generation.
- Performance was above the Public Funds median for the one-, three-, five-, and ten-year periods.



Total Fund Sharpe Ratio Rankings vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Sharpe Ratio for Periods Ended March 31, 2021



- "Sharpe ratio" is a risk-adjusted measure of excess return above the risk-free rate.
- ARMB's risk-adjusted return (Sharpe ratio) was above the Public Funds median for the three-, five-, and 10-year periods.

Total Maximum Drawdown Rankings vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Maximum Drawdown for Periods Ended March 31, 2021



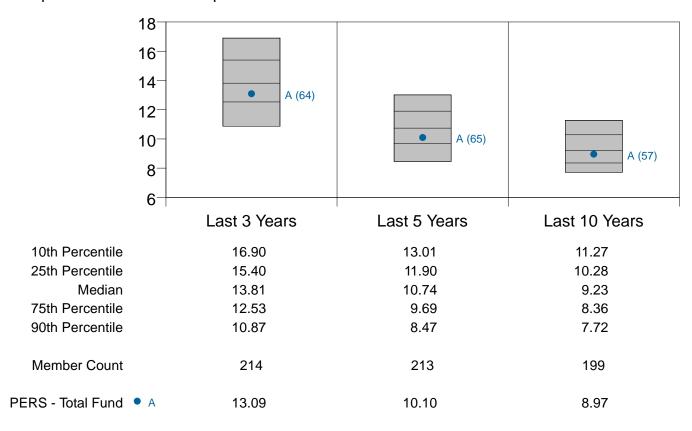
- "Maximum drawdown" is a measure of the largest loss from peak to trough in a given period.
- Lower rankings reflect larger drawdowns (i.e. bigger losses). ARMB's drawdown rankings for all periods have reflected better than average drawdowns (i.e. lower losses) and have improved over time.
- The drawdown experienced in the first guarter of 2020 is the largest of the last 10 years.



Standard Deviation Ranking vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Standard Deviation for Periods Ended March 31, 2021

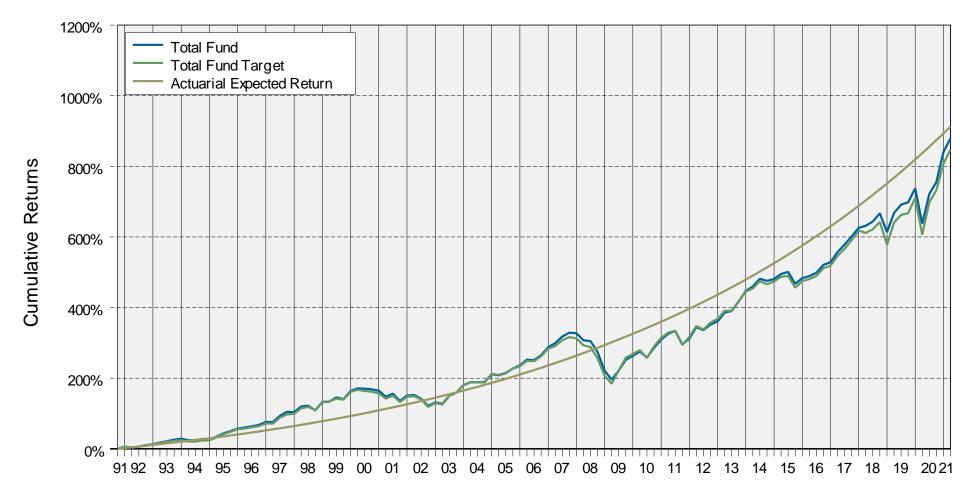


- "Standard deviation" measures variability of returns. It is one measurement of investment risk.
- Less standard deviation results in lower rankings. A lower ranking of standard deviation suggests lower variability.
- ARMB's portfolio diversification has resulted in volatility that is lower than median compared to peers.



PERS Long-Term Total Fund Performance as of 03/31/201

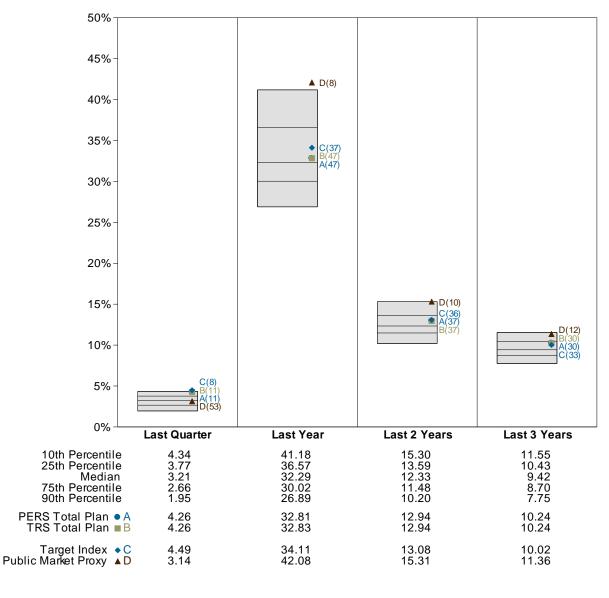
Cumulative Returns Actual vs Target



- Each Fund has two targets: the asset allocation policy return and the actuarial return.
- Total Fund returns continue to closely track the strategic allocation target.
- Market correction setbacks in 3Q15, 4Q18, and 1Q20 have hindered the Total Fund's progress toward closing the gap versus the actuarial return following the Global Financial Crisis of 2008/2009.



Annualized Total Fund Returns as of 03/31/21

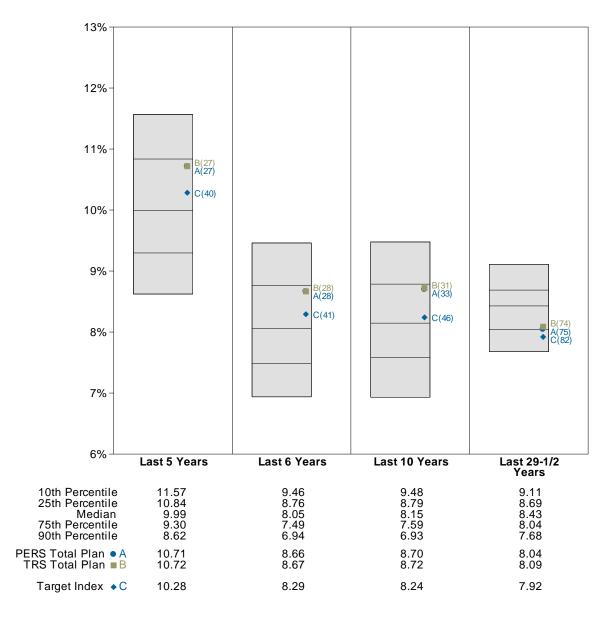


 PERS and TRS have trailed their target for the last quarter, one-year, and two-year periods, but outperformed over the longer threeyear period.

The Public Market Proxy consists of 45% Russell 3000 Index, 30% MSCI ACWI ex US IMI (Net), and 25% Bloomberg Aggregate Index.

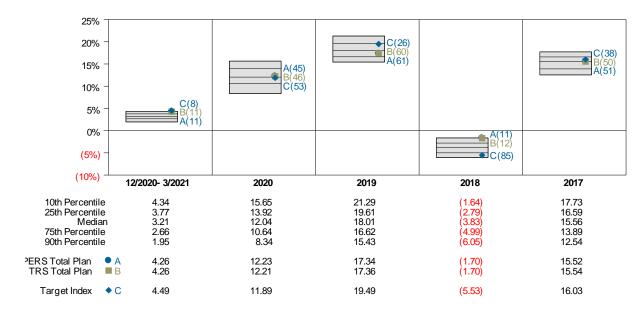


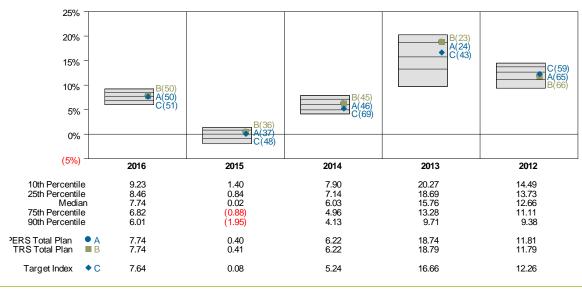
Longer-Term Total Fund Returns as of 03/31/21



- Five-, six-, and ten-year performance is above target and median.
- 29 year and 2 quarter return for PERS beat the target by 12 basis points.

Calendar Period Total Fund Performance





- PERS ranks at or above median in seven and TRS ranks above median in eight of the 10 periods shown.
- Peer group range of returns during 2016, 2015, and 2014 were very tight.
- Wide range of peer group returns during calendar 2013 due to varying fixed-income allocations within the Public Fund universe.



Total Domestic Equity through 03/31/21

Performance vs Public Fund - Domestic Equity (Gross)





Domestic Equity Component Returns

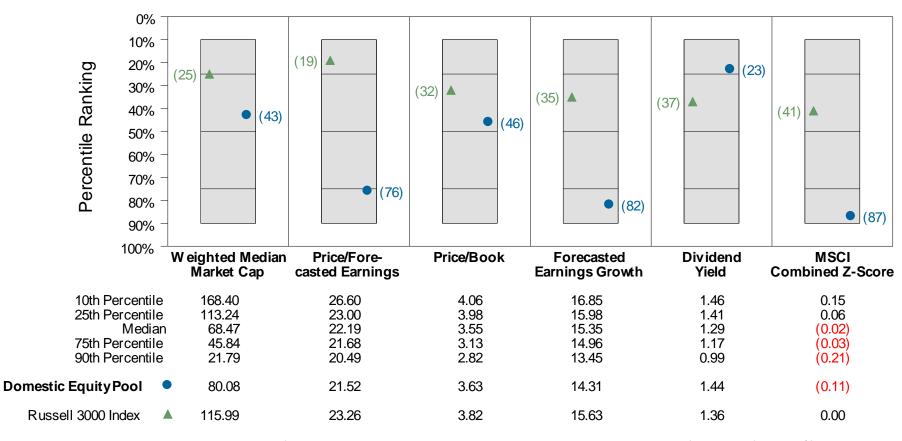
Returns for Periods Ended March 31, 2021

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Total Dom Equity Pool	7.58%	59.49%	15.36%	15.38%	12.86%
Russell 3000 Index	6.35%	62.53%	17.12%	16.64%	13.79%
Large Cap Managers	6.64%	56.51%	15.50%	15.45%	13.27%
Russell 1000 Index	5.91%	60.59%	17.31%	16.66%	13.97%
Small Cap Managers	18.31%	94.86%	14.89%	16.54%	12.17%
Russell 2000 Index	12.70%	94.85%	14.76%	16.35%	11.68%

- The large cap composite trailed its benchmark (the Russell 1000 Index) over all periods shown in the table with the exception being the most recent quarter.
- The small cap composite has outperformed its benchmark (the Russell 2000 Index) over all periods shown.

Domestic Equity Portfolio Characteristics

Portfolio Characteristics Percentile Rankings Rankings Against Public Fund - Domestic Equity as of March 31, 2021

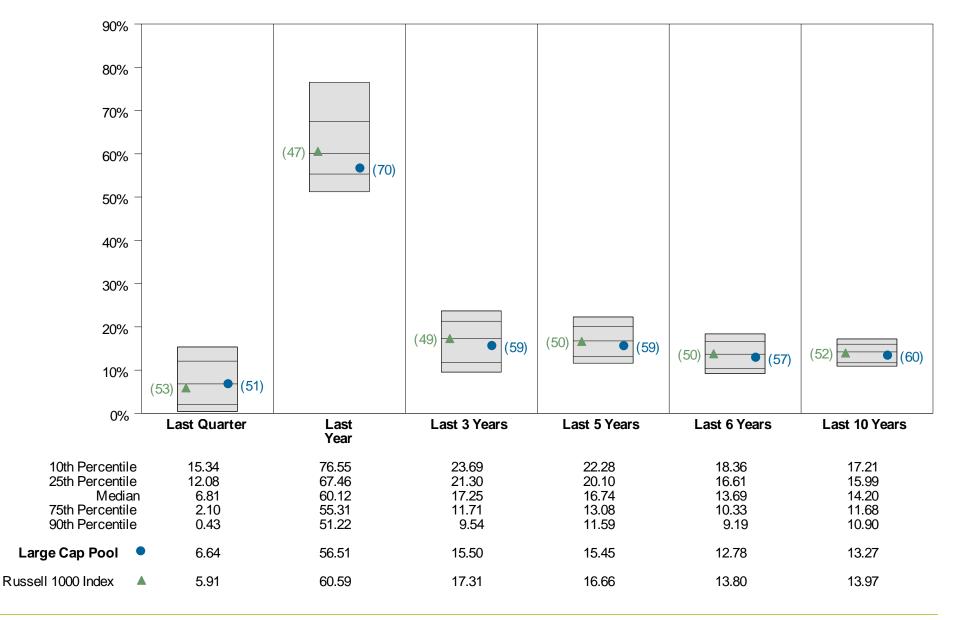


- ARMB's overall domestic equity portfolio's market capitalization is smaller than 43% of public funds (first column).
- Overall, ARMB's domestic equity portfolio tilts decidedly "value" versus peers (last column on right).
 - "MSCI Combined Z-Score" measures Growth and Value characteristics of individual stocks within managers' portfolios.
 - A low Z-Score rank (i.e. the dot appears towards the top of the floating bar) indicates a Growth bias.
 - A high Z-Score rank (i.e. the dot appears towards the bottom of the floating bar) indicates a Value bias.



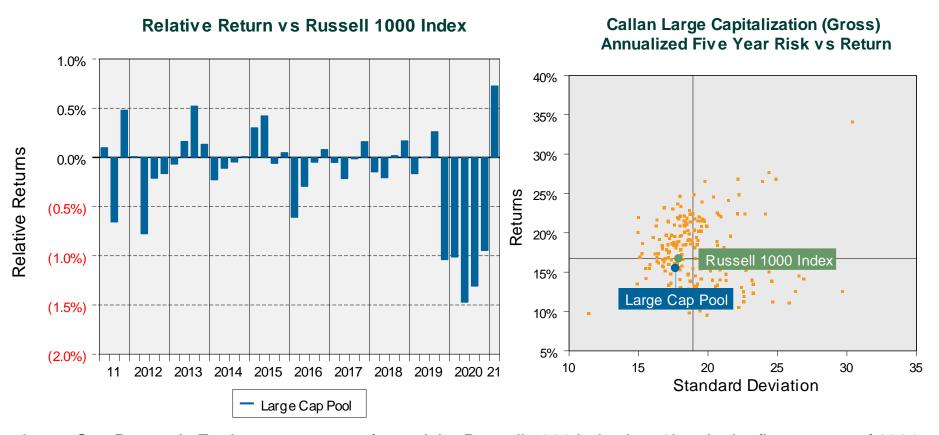
Large Cap Domestic Equity through 03/31/21

Performance vs Callan Large Capitalization (Gross)





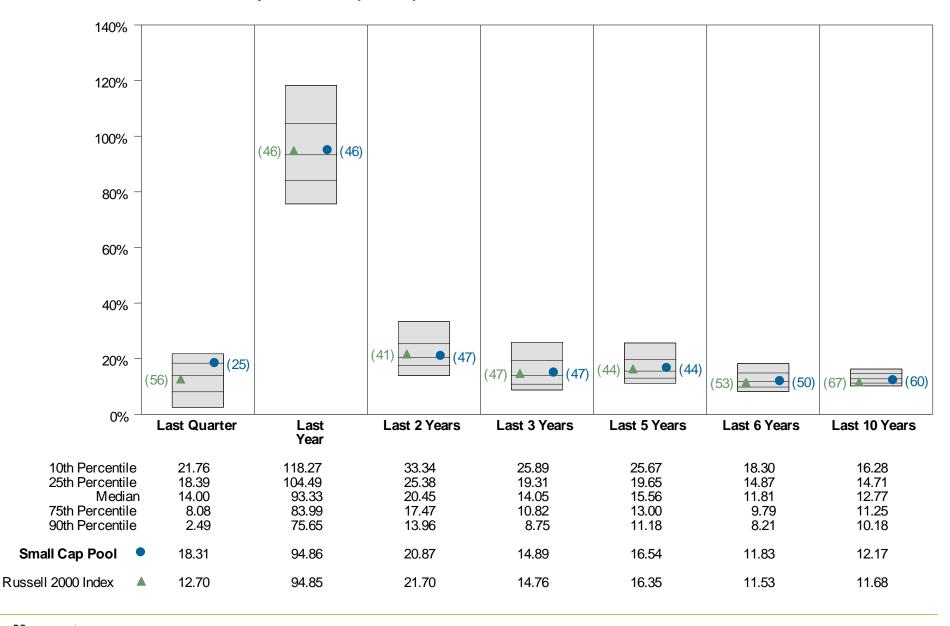
Large Cap Domestic Equity as of 03/31/21



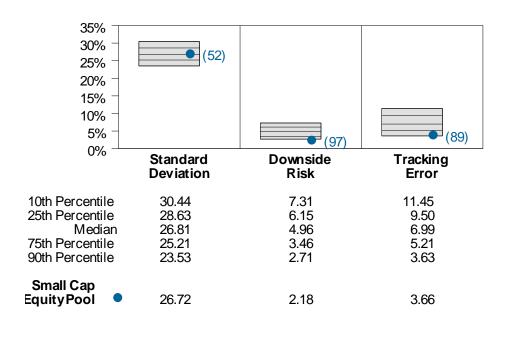
- Large Cap Domestic Equity returns outperformed the Russell 1000 index by 73bps in the first quarter of 2021.
- Long-term performance exhibits market-like returns with similar risk.
- In the previous five quarters, underperformance vs. the Russell 1000 Index was driven by Scientific Beta, which trailed the broad benchmark by between 2% and 4% in each of those quarters.
- In the previous three quarters, passive implementation also detracted as the S&P 900 Index trailed the Russell 1000 Index by 1.1% in 2Q20, 0.8% in 3Q20, and 0.9% in 4Q20.

Small Cap Domestic Equity through 03/31/21

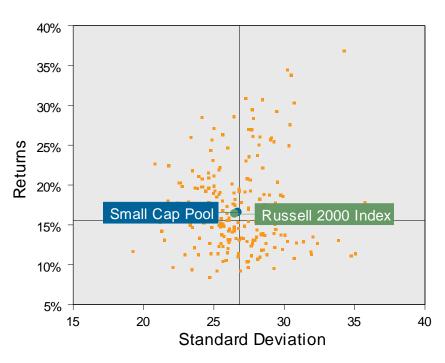
Performance vs Callan Small Capitalization (Gross)



Small Cap Domestic Equity through 03/31/21



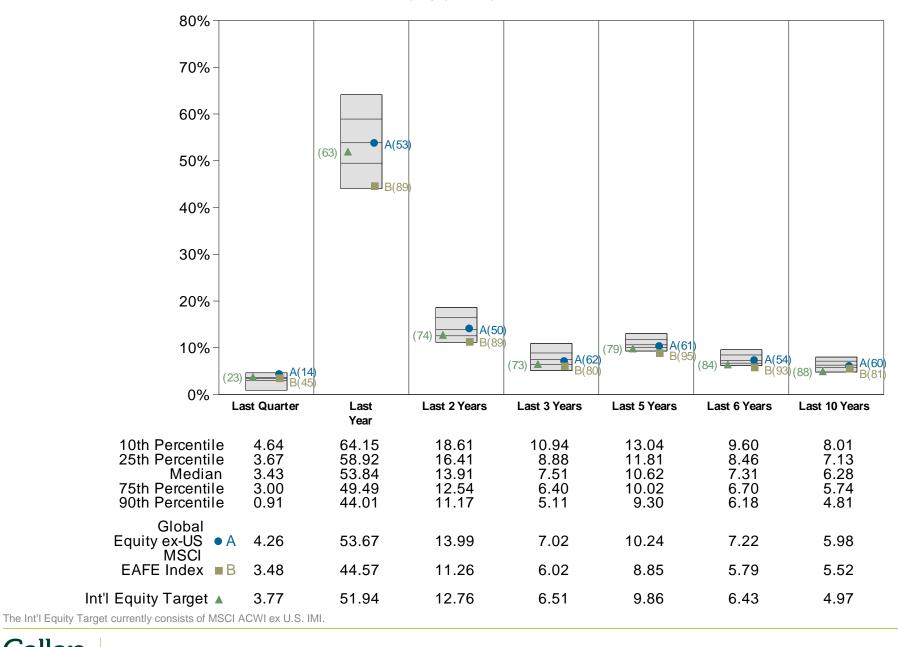
Callan Small Capitalization (Gross) Annualized Five Year Risk vs Return



 The five-year risk statistics of standard deviation, downside risk, and tracking error compare favorably versus the peer group of small cap managers.

Global Equity ex-US through 03/31/21

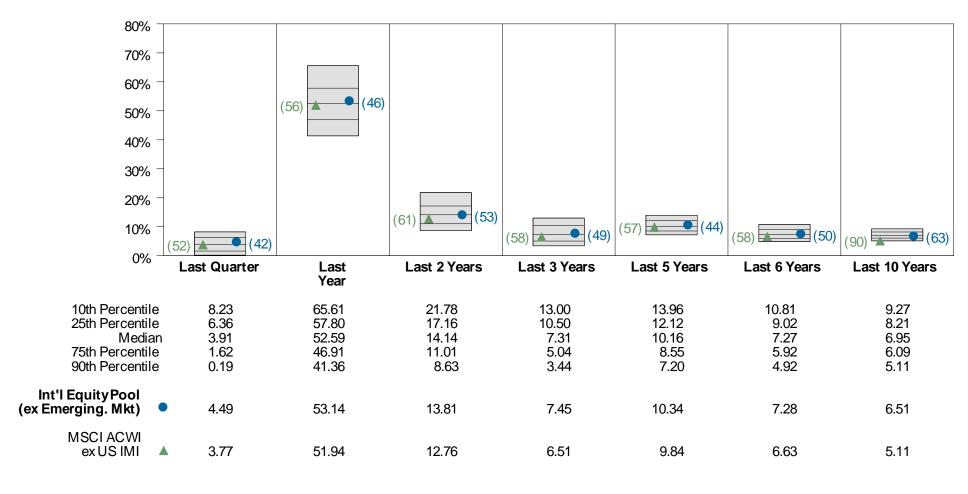
Performance vs Public Fund - International Equity (Gross)





International Equity ex Emerging Markets through 03/31/21

Performance vs Callan Non-US Equity (Gross)





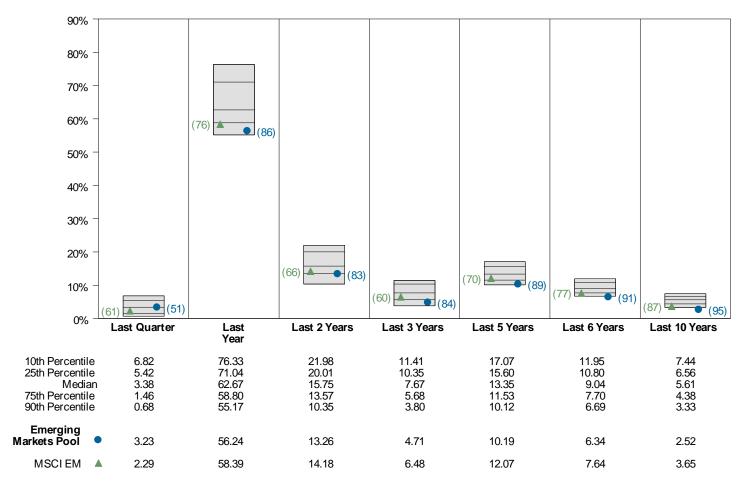
International Equity ex Emerging Markets through 03/31/21

			Last	Last	Last
	Last	Last	3	5	10
	Quarter	Year	Years	Years	Years
Int'l Equity Pool (ex Emerging Market)	4.49%	53.14%	7.45%	10.34%	6.51%
Arrowstreet ACWI ex -US	7.62%	68.68%	12.11%	14.27%	-
Baillie Gifford ACWI ex US	0.30%	67.10%	14.93%	14.94%	-
Brandes Investment	9.07%	55.17%	3.73%	7.05%	5.52%
Capital Guardian	2.18%	57.24%	13.88%	15.16%	8.81%
L&G Sci Beta Dev ex US	4.23%	45.00%	-	-	-
SSgA World ex US IMI	4.20%	48.50%	-	-	-
MSCI EAFE Index	3.48%	44.57%	6.02%	8.85%	5.52%
MSCI ACWI ex-US IMI Index	3.77%	51.94%	6.51%	9.84%	5.11%



Emerging Markets through 03/31/21

Performance vs Callan Emerging Broad (Gross)



- After underperforming by 3.76% in 2Q17, 1.38% in 3Q17, 1.68% in 4Q17, 4.03% in 2Q18, 1.87% in 1Q19, 1.41% in 4Q19, and 0.94% in 1Q21 the Emerging Markets Pool lags the benchmark and ranks in the bottom quartile over periods of one year and longer.
- DRZ and Lazard were liquidated and L&G Scientific Beta was funded in 4Q19, leaving only passive and smart beta approaches within the emerging markets equity space.

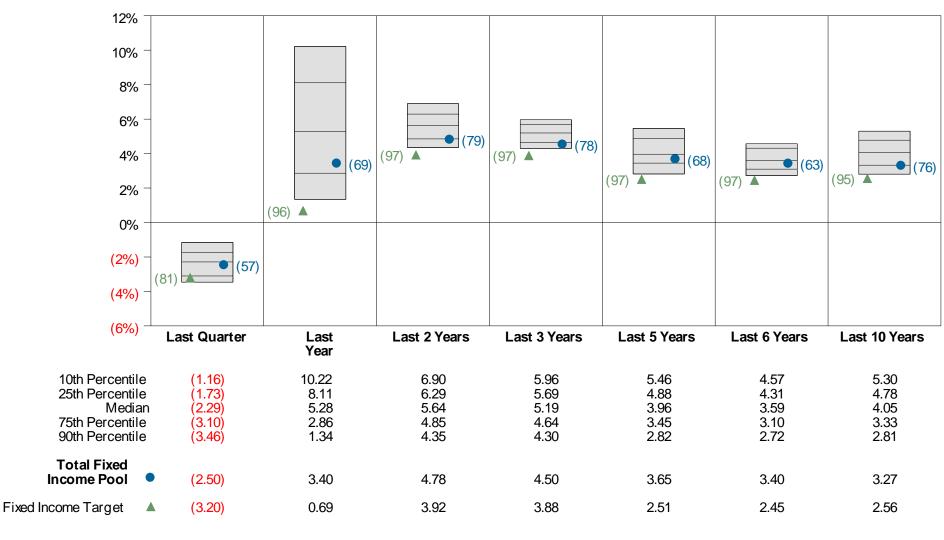


Emerging Markets Pool through 03/31/21

			Last	Last	Last
	Last	Last	3	5	10
	Quarter	Year	Years	Years	Years
Emerging Markets Pool	3.23%	56.24%	4.71%	10.19%	2.52%
SSgA Emerging Markets	2.17%	57.87%	-	-	-
L&G SciBeta EM	5.72%	51.70%	-	-	-
MSCI EM	2.29%	58.39%	6.48%	12.07%	3.65%

Total Fixed Income as of 03/31/21

Performance vs Public Fund - Domestic Fixed (Gross)



- Yields rose meaningfully across the curve in the first quarter driving bond returns negative.
- The transition from intermediate Treasury to Aggregate mandates was completed during the fourth quarter of 2019.

Total Fixed Income through 03/31/21

			Last	Last	Last
	Last	Last	3	5	10
	Quarter	Year	Years	Years	Years
Fixed Income	(2.50%)	3.40%	4.50%	3.65%	3.27%
Fixed Income Target	(3.20%)	0.69%	3.88%	2.51%	2.56%
Blmbg Treasury Intmdt	(1.76%)	(1.27%)	3.76%	2.06%	2.33%
ARMB US Aggregate	(3.61%)	1.37%	-	-	-
Opportunistic Fixed Income	(1.59%)	13.56%	5.17%	6.23%	6.09%
FIAM Tactical Bond	(2.29%)	13.42%	6.56%	6.46%	-
Blmbg Aggregate	(3.37%)	0.71%	4.65%	3.10%	3.44%
FIAM REHI	3.42%	20.68%	3.88%	4.41%	-
BImbg:Universal CMBS xAaa	0.35%	12.90%	5.72%	4.92%	4.99%
Alternative Fixed Income	1.60%	2.08%	-	_	_
Crestline (Blue Glacier)	1.10%	2.19%	4.25%	6.42%	5.84%
Prisma Capital (Polar Bear)	2.83%	(1.96%)	1.40%	3.34%	2.98%
Crestline Specialty Lending Fund	8.89%	21.04%	16.65%	15.72%	-
Crestline Specialty Lndg Fd II	5.21%	11.17%	11.36%	-	-
HFRI Fund of Funds Index	1.87%	23.83%	5.43%	5.61%	3.42%
T-Bills + 5%	1.25%	5.12%	6.49%	6.19%	5.63%



Opportunistic through 03/31/21

	Last	Last	Last 3	Last 5	Last 10
	Quarter	Year	Years	Years	Years
Opportunistic (T)	1.04%	25.95%	8.21%	-	-
Alternative Equity Strategies	(1.46%)	55.35%	15.36%	12.90%	9.82%
McKinley Healthcare Transformation	(1.46%)	55.35%	-	-	-
Russell 1000 Index	5.91%	60.59%	17.31%	16.66%	13.97%
Other Opportunities	(5.06%)	(6.55%)	(0.11%)	1.78%	-
Project Pearl	(1.27%)	(6.99%)	-	-	-
Schroders Insurance Linked	(7.31%)	(6.87%)	(1.84%)	-	-
T-Bills + 6%	1.49%	6.12%	7.49%	7.19%	6.63%
Tactical Allocation Strategies	1.99%	37.16%	-	-	-
PineBridge	1.71%	40.17%	-	-	-
Pine Bridge Benchmark	(0.16%)	28.70%	5.03%	6.88%	3.86%
Fidelity Signals	2.26%	34.30%	-	-	-
Fidelity Signals Benchmark	1.68%	32.28%	9.40%	9.36%	7.11%
Alternative Beta	0.90%	(13.48%)	(7.35%)	(4.80%)	-
Man Group Alternative Risk Premia	0.90%	(8.26%)	(3.89%)	-	-
T-Bills + 5%	1.25%	5.12%	6.49%	6.19%	5.63%



Real Assets through 03/31/21

Real Assets through 03/3 1/2	•		Last	Last	Last
	Last	Last	3	5	10
	Quarter	Year	Years	Years	Years
Real Assets	2.70%	6.74%	5.50%	6.21%	7.42%
Real Assets Target (1)	4.36%	20.84%	5.72%	5.26%	7.46%
Real Estate	4.60%	12.28%	7.29%	7.22%	9.76%
Real Estate Target (2)	2.38%	5.54%	5.67%	6.08%	9.00%
Private Real Estate	2.49%	6.31%	6.51%	7.27%	9.90%
NCREIF NFI-ODCE Val Wt Nt	1.89%	1.47%	3.96%	5.26%	8.67%
NCREIF Total Index	1.72%	2.61%	4.89%	5.81%	8.82%
ARMB REIT	8.10%	33.93%	10.61%	7.01%	9.24%
NAREIT Equity Index	8.32%	34.24%	10.78%	7.19%	9.35%
Total Farmland	2.71%	7.13%	5.03%	4.81%	7.74%
UBS Agrivest	2.71%	7.55%	5.61%	5.29%	8.64%
ARMB Farmland Target (3)	1.49%	5.42%	5.17%	5.31%	8.58%
Total Timber	2.11%	3.96%	2.89%	2.99%	4.64%
Timberland Investment Resources	2.11%	3.49%	2.92%	3.16%	4.25%
NCREIF Timberland Index	0.76%	1.46%	1.71%	2.51%	4.55%
Total Energy Funds	4.46%	1.58%	(5.15%)	4.60%	(2.81%)
CPI + 5%	3.07%	8.01%	7.08%	7.21%	6.65%
Total Infrastructure	1.85%	9.73%	10.28%	10.93%	-
JPM Infrastructure	1.71%	10.07%	6.03%	7.36%	-
IFM Infrastructure	1.88%	9.64%	10.60%	12.62%	-
CPI + 4%	2.84%	7.01%	6.08%	6.20%	5.64%
Global Infrastructure Idx	3.00%	37.04%	5.69%	6.75%	6.27%

⁽¹⁾ As of 10/01/2019, Real Assets Target is 37.5% NFI-ODCE Value Weight Net Index, 10% FTSE NAREIT All Equity Index, 25% NCREIF Farmland Index, 10% NCREIF Timberland Index, 17.5% CPI+4.

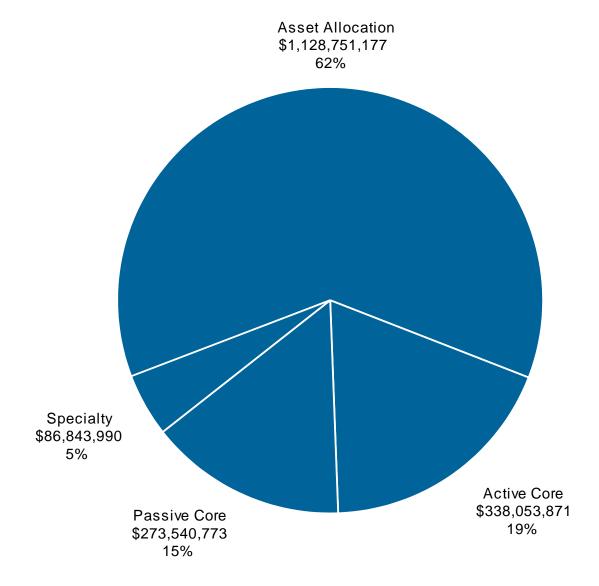
⁽³⁾ ARMB Custom Farmland Target is leased-only properties in the NCREIF Farmland Index reweighted to reflect 90% row crops and 10% permanent crops until 1/1/08 and 80% row crops and 20% permanent crops thereafter . Farmland and Timber data supplied by the manager and may vary from State Street returns due to timing variations.



⁽²⁾ ARMB Custom Real Estate Target is 90% NCREIF Property Index and 10% FTSE NAREIT All Equity REIT Index.

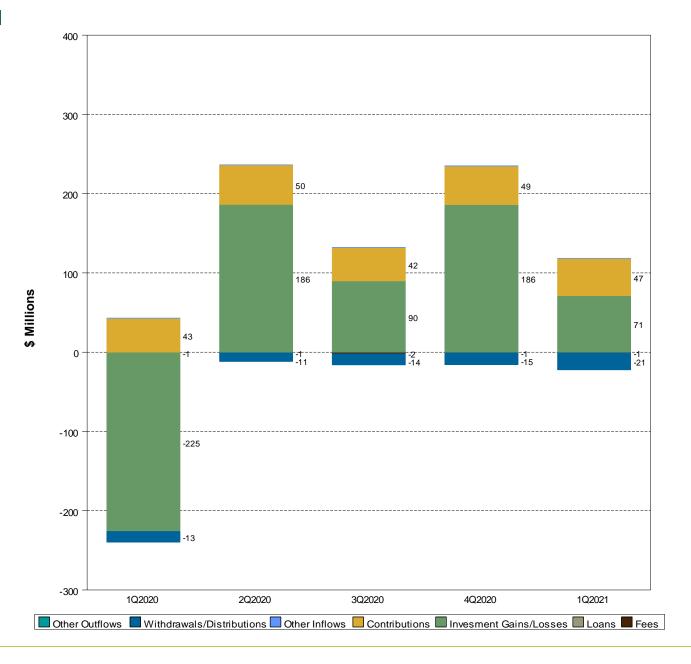
Participant-Directed Plans

PERS DC Plan



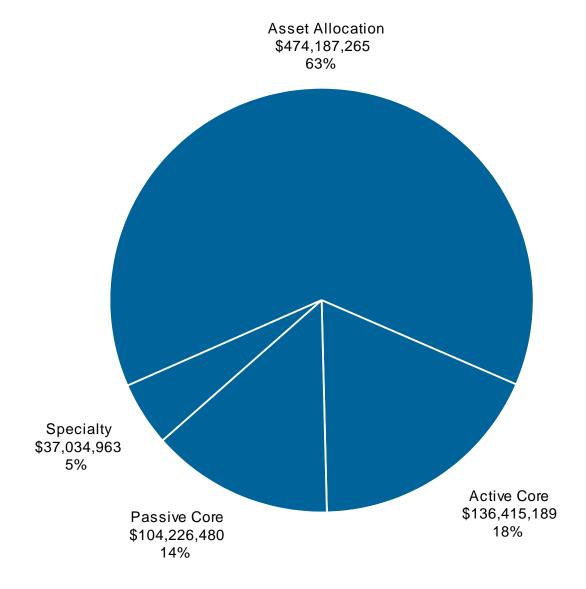


PERS DC Plan: Asset Changes



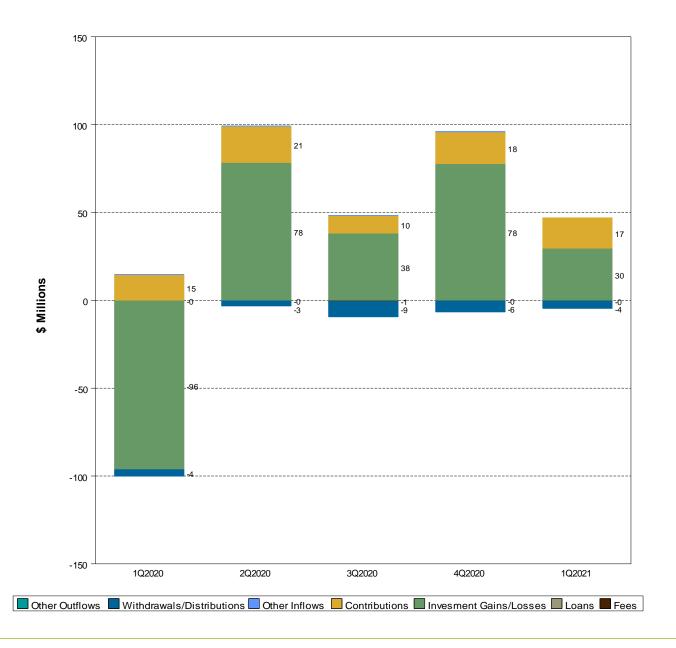


TRS DC Plan



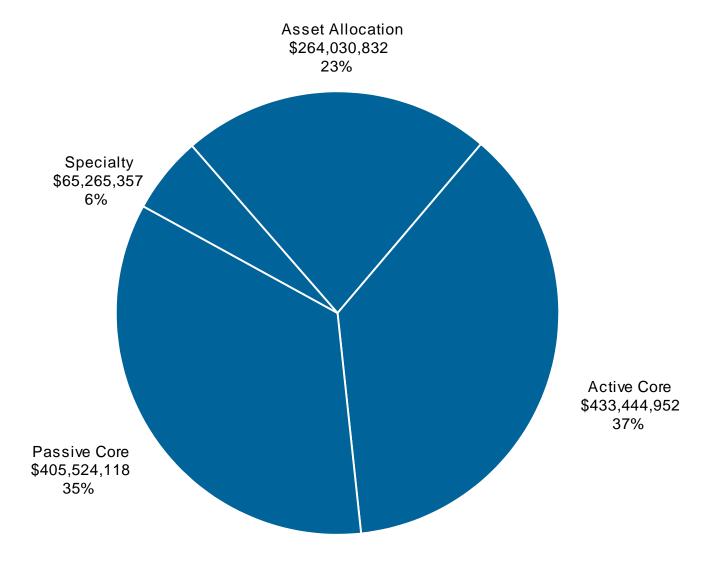


TRS DC Plan: Asset Changes



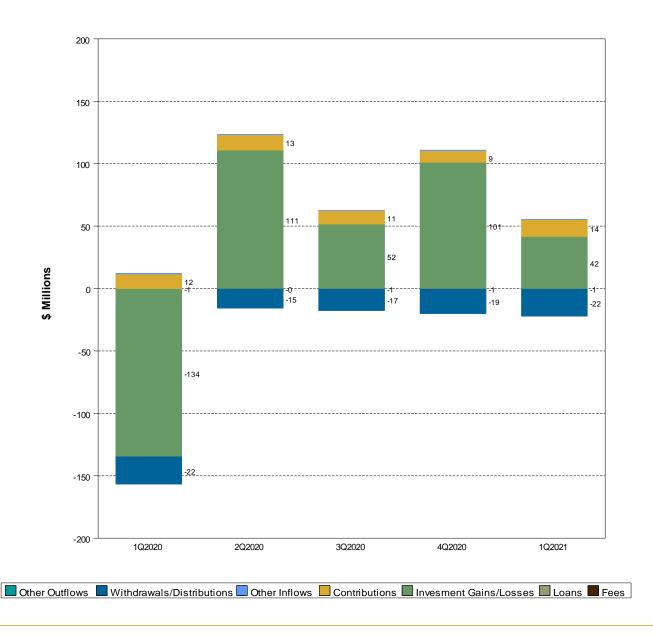


Deferred Comp Plan



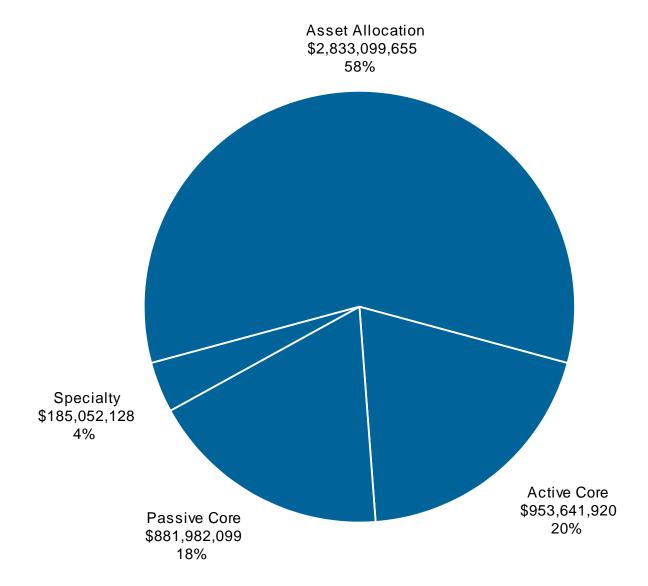


Deferred Comp Plan: Asset Changes



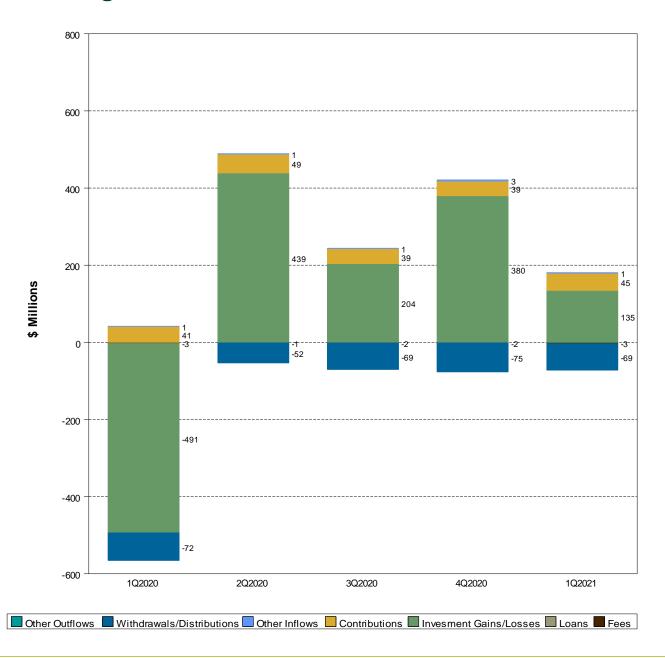


SBS Fund





SBS Fund: Asset Changes





Individual Account Option Performance: 03/31/21

Balanced & Target Date Funds

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Asset Allocation										
Alaska Balanced Trust	0.9 45	19.4 55	7.8 14	7.0 25	5.8 18	6.3 72		-0.0 28	0.3 100	0.9 2
CAIMATgt Alloc Cons MFs Passive Target	0.8 46	19.2 55	7.8 14	7.0 25	5.9 18	6.4 69				0.9 4
Alaska Long-Term Balanced CAI MA Tgt Alloc Mod MFs	2.6 54	33.3 47	10.2 30	9.9 33	7.8 30	10.7 60		-0.5 52	0.3 100	0.8 23
Passive Target	2.6 54	33.3 47	10.4 27	10.0 32	8.0 28	10.9 59				0.8 23
Target 2010 Trust CAI Tgt Date 2010	1.5 19	21.6 38	7.8 36	7.5 50	6.1 48	7.3 52		-0.3 64	0.3 99	0.9 32
Custom Index	1.4 19	21.7 37	7.9 31	7.6 48	6.2 42	7.4 49				0.9 33
Farget 2015 Trust CAI Tgt Date 2015	1.9 24	25.1 41	8.6 23	8.6 28	6.9 27	8.4 42		0.0 28	0.3 99	0.9 26
Custom Index	1.8 25	25.2 41	8.6 22	8.6 28	6.9 28	8.6 41				0.9 34
Target 2020 Trust CAI Tgt Date 2020	2.4 16	30.3 22	9.6 15	9.7 16	7.7 12	10.1 26		-0.1 17	0.3 100	0.8 22
Custom Index	2.4 17	30.5 22	9.6 14	9.8 16	7.7 12	10.3 24				0.8 26
arget 2025 Trust CAI Tgt Date 2025	3.0 10	35.6 15	10.5 8	10.8 9	8.5 8	11.7 20		-0.1 12	0.3 100	0.8 16
Custom Index	3.0 10	35.9 13	10.6 7	10.8 8	8.5 8	11.9 17				0.8 21
arget 2030 Trust CAI Tgt Date 2030	3.5 17	40.5 19	11.3 12	11.7 15	9.1 11	13.1 28		-0.3 23	0.3 100	0.8 17
Custom Index	3.5 17	40.8 17	11.5 11	11.8 13	9.1 10	13.3 26				0.8 19
arget 2035 Trust CAI Tgt Date 2035	3.9 37	44.9 33	12.1 16	12.5 18	9.6 15	14.3 45		-0.2 23	0.3 100	9 8.0
Custom Index	3.9 37	45.1 31	12.2 15	12.6 18	9.7 15	14.5 41				0.8 11
Target 2040 Trust CAI Tgt Date 2040	4.4 57	48.6 40	12.6 17	13.1 ₁₇	10.1 14	15.3 54		-0.2 22	0.3 100	0.8 6
Custom Index	4.4 57	48.8 37	12.7 16	13.2 16	10.1 13	15.5 49				0.8 7
Target 2045 Trust CAI Tgt Date 2045	4.7 59	51.7 49	13.0 13	13.5 15	10.3 12	16.1 62		-0.4 24	0.3 99	9 8.0
Custom Index	4.7 58	51.9 44	13.2 10	13.6 14	10.3 12	16.2 60				0.8 10
	median d quartile	Quadrant:		Excess Retinuted above multiple third qualified fourth qualified and the fourth qualified and th	edian artile		racking Error: below median second quartile first quartile	е	Sharpe Ra above third q	median uartile



Individual Account Option Performance: 03/31/21

Balanced & Target Date Funds

Investment Manager		Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Target 2050 Trust		4.7 74	51.8 63	13.0 12	13.5 18	10.3 13	16.1 75		-0.4 34	0.3 99	0.8 7
CAI Tgt Date 2050 Custom Index		4.8 73	52.0 58	13.2 10	13.6 13	10.4 11	16.2 69				0.8 7
Target 2055 Trust		4.8 75	51.7 70	13.0 18	13.5 20	10.3 19	16.1 80		-0.4 32	0.3 100	0.8 8
CAI Tgt Date 2055 Custom Index		4.8 75	52.0 65	13.2 12	13.6 19	10.4 18	16.2 74				0.8 8
Target 2060 Trust		4.7 77	51.6 74	12.9 24	13.4 29		16.1 79		-0.7 71	0.3 100	0.8 11
CAI Tgt Date 2060 Custom Index		4.8 76	52.0 65	13.2 13	13.6 23		16.2 72				0.8 8
Target 2065 Trust		4.7 61	51.6 75								
CAI Tgt Date 2065 Custom Index		4.8 61	52.0 65								
Returns: above median third quartile fourth quartile	Risk: below median second quartile first quartile	Return	k Quadrant:		above third	Retum Ratio: e median quartile quartile		racking Erro below med second qu first quartil	dian artile	third	Ratio: /e median quartile h quartile



Other Options: 03/31/21

Passive Strategies

Investment Manag	er	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Index Funds											
SSgA S&P 500 Index No	• •	6.2 8	56.3 19	16.8 15	16.3 12	13.6 14	17.2 48		-0.6 13	0.0 80	0.9 10
S&P 500 Index		6.2 18	56.4 12	16.8 9	16.3 9	13.6 7	17.2 36				0.9 8
SSgA Russell 3000 CAI Mut Fd: Large Cap	• •	6.3 52	62.4 31	17.1 48	16.6 44	13.4 46	18.3 58		-0.9 84	0.0 100	0.8 51
Russell 3000 Index		6.3 52	62.5 31	17.1 48	16.6 44	13.4 46	18.4 57				0.8 51
SSgA World Equity CAIMF: Non-U.S. Equ MSCI ACWI x U.S. I		3.6 52 3.5 53	50.9 55 49.4 64	6.6 44 6.5 45	10.0 39 9.8 42	5.4 49 5.3 51	18.3 69 18.0 78		0.2 32	0.9 99	0.5 38 0.5 38
	e US Bd Index Fund (i)	-3.4 83	0.7 98		9.0 42	3.3 51	10.0 /8				0.5 38
Blmbg Aggregate		-3.4 81	0.7 98	4.7 90	3.1 99	3.3 75	3.7 77				0.5 93
Returns: above median third quartile fourth quartile	Risk below median second quartile first quartile	Return	Quadrant:		Excess Return above must third qualification for the properties of the control of	edian artile		racking Error: below median second quartile first quartile	е	_	median uartile

⁽i) – Indexed scoring method used. Green: manager & index ranking differ by less than +/- 10 percentiles; Yellow: manager and index ranking differ by +/- 20 percentiles; Red: manager & index ranking differ by more than 20 percentiles.



Other Options: 03/31/21

Active Equity, Stable Value, and Money Market

Investment Manager		Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Active and Other Funds											
BlackRrock Strategic Co	mpletion Fd	3.2 63	23.7 77								
Strategic Completion Cus	tom Index	3.3 61	23.9 77								
Northern Trust ESG Fund Callan Lg Cap Broad MF	I	6.9 45	55.5 69								
MSCI USA ESG		7.0 45	55.9 67	17.6 45	16.5 46	13.2 49	16.3 92				0.9 36
International Equity Fund CAI Mut Fd: Non-U.S. Equity S		4.8 30	60.5 23	8.4 36	9.3 48		19.5 44		-0.1 48	3.3 83	0.4 51
MSCI ACWI ex US Index		3.5 53	49.4 64	6.5 45	9.8 42	5.3 51	18.0 78				0.5 38
T. Rowe Price Small Cap CAI Mut Fd: Sm Cap Broad St		8.7 53	83.7 67	20.2 26	19.5 35	13.9 33	22.8 93		0.6 24	7.0 83	0.8 24
Russell 2000 Index		12.7 40	94.8 41	14.8 53	16.4 52	11.0 55	26.5 47				0.6 55
T. Rowe Price Stable Va	ue	0.5 3	2.3 ₂	2.5 ₁	2.4 ₁	2.4 ₁	0.1 93		3.3 5	0.4 20	14.6 ₁
FTSE 3 Mo T-Bill		0.0 99	0.2 99	1.5 95	1.2 98	0.8 100	0.4 1				-0.1 98
SSgA Inst Treasury Mone	ey Market	0.0 100	0.1 23	1.3 10	1.0 7	0.7 10	0.4 8		-3.5 24	0.0 96	-0.4 7
FTSE 3 Mo T-Bill		0.0 6	0.2 4	1.5 2	1.2 2	0.8 2	0.4 5				-0.1 2
Returns: above median third quartile fourth quartile	Risk below median second quartile first quartile	Return	Quadrant:		Excess Ret above m third qu fourth q	edian artile		racking Error: below median second quartile first quartile	9	Sharpe Rabove third q	median uartile



Callan

Callan Update

Callan Institute Events

Upcoming conferences, workshops, and webinars

2021 National Conference

July 19-21, 2021

Salt Lake City, UT

We are excited to announce our confirmed speakers and workshop topics below. We will continue to update you as we finalize our lineup for this event!

Confirmed Conference Speakers:

- Niall Ferguson
- Scott Gottlieb, M.D.

This year's Callan-led workshops will cover the following topics:

- Callan's Fund Sponsor Cost of Doing Business Survey Results
- Defined Contribution: Are Managed Accounts Adding Value?
- How to Navigate Your Corporate DB Plan in This Low-Rate Era
- Real Estate Debt as an Alternative to Traditional Fixed Income in the Hunt for Yield

Callan College

Learn the Fundamentals

This course is for institutional investors, including trustees and staff members of nonprofits, and public and corporate funds. This session familiarizes fund sponsor trustees and staff with basic investment theory, terminology, and practices.

Join our next virtual session:

Aug. 17, 2021 - Aug. 19, 2021

2-3 hour sessions over 3 days

Join our next LIVE session in Chicago:

Oct. 6, 2021 - Oct. 7, 2021

1.5-day session held in Callan's Chicago office

Webinars

Research Café: Insurance Session

May 19, 2021 – 9:30am (PT)

Inflation and Why Debt Matters

May 25, 2021 – 9:30am (PT)

Callan Updates

Firm updates by the numbers, as of March 31, 2021

Total Associates: 195

Ownership

- 100% employees

- Broadly distributed across 99 shareholders

Leadership Changes

No changes to leadership this quarter

Total General and Fund Sponsor Consultants: more than 55

Total Specialty and Research Consultants: more than 60

Total CFA/CAIA/FRMs: more than 55

Total Fund Sponsor Clients: more than 400

AUA: more than \$3 trillion

"Dave brings decades of institutional investment experience, depth, and perspective in private markets to Callan. His experience at a major university endowment will add tremendous value to our nonprofit clients. His experience as a private equity fund-of-funds investor will contribute to our team's ability to source compelling funds and build lasting portfolios for all of our clients invested in private equity.

--- Pete Keliuotis on the recent hiring of David Smith, senior vice president, to our Alternatives Consulting group.



Disclaimers

This report is for informational purposes only and should not be construed as legal or tax advice on any matter. Any decision you make on the basis of this content is your sole responsibility. You should consult with legal and tax advisers before applying any of this information to your particular situation.

This report may consist of statements of opinion, which are made as of the date they are expressed and are not statements of fact.

Reference to or inclusion in this report of any product, service or entity should not be construed as a recommendation, approval, affiliation or endorsement of such product, service or entity by Callan.

Past performance is no guarantee of future results.

The statements made herein may include forward-looking statements regarding future results. The forward-looking statements herein: (i) are best estimations consistent with the information available as of the date hereof and (ii) involve known and unknown risks and uncertainties such that actual results may differ materially from these statements. There is no obligation to update or alter any forward-looking statement, whether as a result of new information, future events or otherwise. Undue reliance should not be placed on forward-looking statements.

Pathway Capital Management

Mandate: Private Equity Hired: 2002

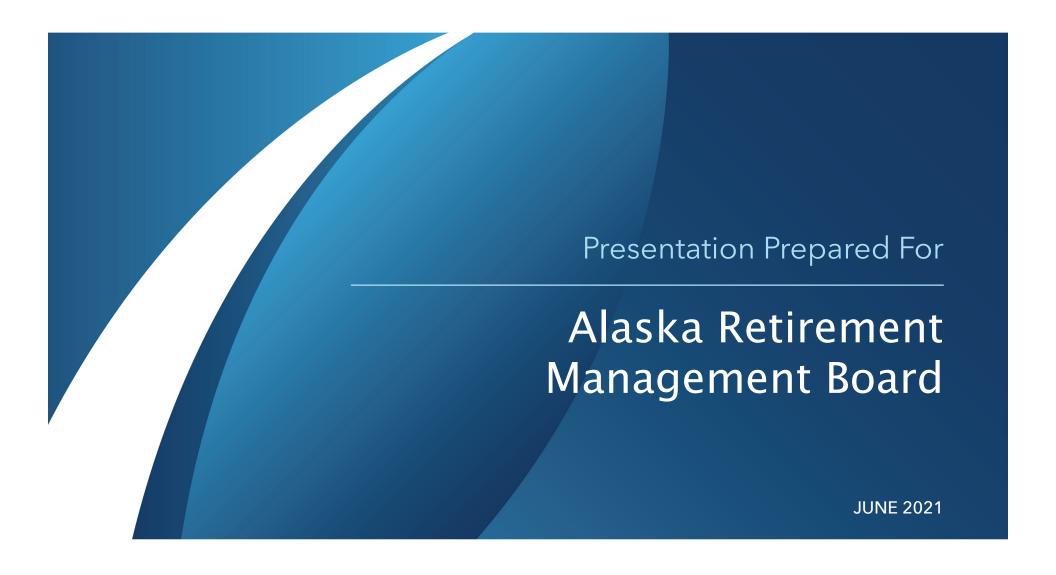
Firm Information	Investment Approach	Total ARMB Mandate
Founded in 1991, Pathway creates and manages private equity separate accounts and funds of funds for institutional investors. Pathway manages capital on behalf of some of the largest corporate and public pension plans, government entities, and financial institutions around the globe. The firm's assets under management are \$75 billion as of 12/31/2020. Pathway is registered as an investment advisor with the SEC in the United States and as a portfolio manager and exempt market dealer in Ontario, Quebec, and Saskatchewan, Canada. Pathway's wholly owned UK subsidiary is regulated in the UK by the Financial Services Authority. Pathway's wholly owned Hong Kong subsidiary is regulated in Hong Kong by the Securities and Futures Commission.	Pathway is extremely selective in choosing private equity investment funds. Every partnership must meet rigid standards regarding the overall quality of the investment opportunity, such as: Target markets that can support private equity investing Long-term and proven private equity business model Stable management team operating under a consistent firm culture Proven access to high-quality investment opportunities and resources Strong track record Pathway's decision-making process uses a team approach; no one individual has authority to make decisions regarding portfolio management without the input of other senior professionals. Final investment decisions are made by the Investment Committee comprised of three senior managing directors and seven managing directors.	Assets Under Management: 12/31/2020 Market Value: \$1,854 million
Key Executives: Jim Chambliss, Managing Director Canyon Lew, Managing Director Wyatt Geiger, Sr. Vice President	Benchmark: 1/3 S&P 500, 1/3 Russell 2000, 1/3 MSCI EAFE +200 basis points and the Cambridge vintage year peer comparison.	

Concerns: None

Performance

The since inception internal rate of return (IRR) for ARMB's Pathway portfolio is 15.4% through 12/31/2020, which compares favorably against the public market equivalent return of ARMB's blended benchmark (1/3 S&P 500, 1/3 Russell 2000, 1/3 MSCI EAFE) of 8.7%.

ARMB's portfolio managed by Pathway has outperformed the Cambridge median over all vintage years with four vintage years in the top quartile and 13 in the second quartile when compared against the Cambridge database for vintage years 2001-2017.





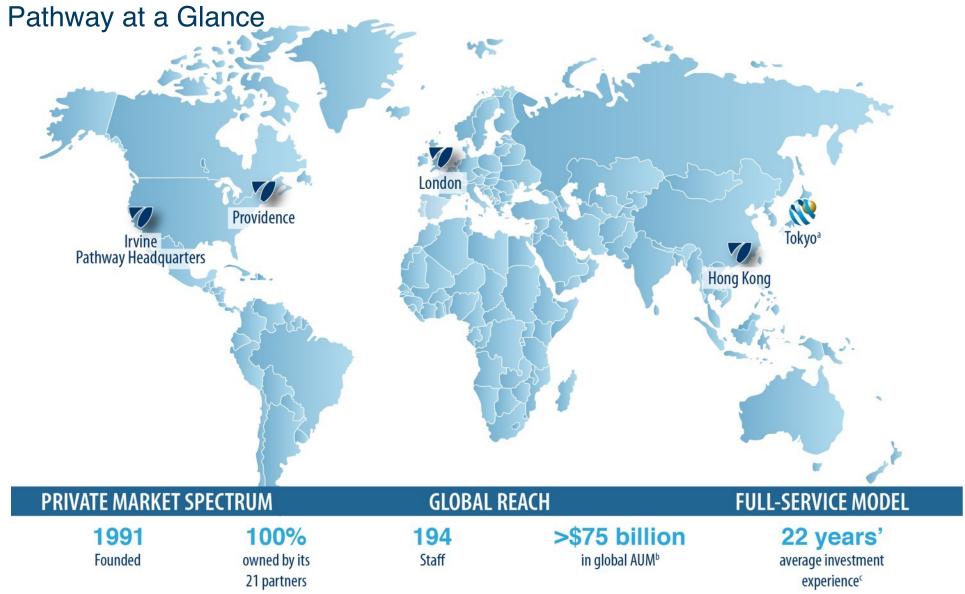




- Pathway Update
- Portfolio Update
- SPAC Overview
- Appendix



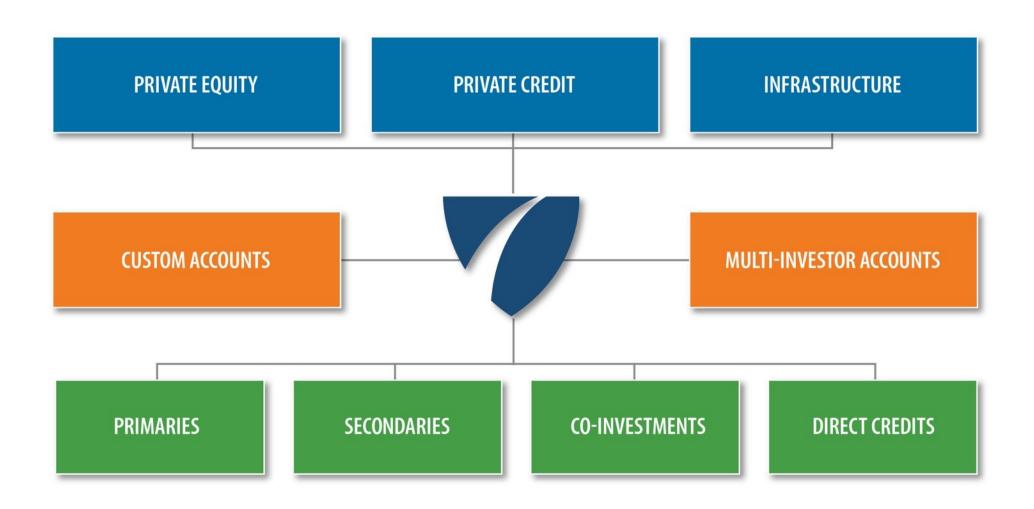




^aStrategic alliance with Tokio Marine Asset Management. ^bRepresents roll-forward market value plus undrawn capital as March 31, 2021. ^cRepresents Pathway's 19 investment partners.



Global Provider of Private Market Solutions





Organizational Chart

Investment Team

•	glas K. Le Bon	James H. Reinl		n J. Jakobi	Alex M. Casb		James R. Chambliss		
	Managing Director	Senior Managing [ing Director & Co-ClO			Managing Director	Managing D	
Jason C. Jenkins, CFA			Canyon J. Lew	Matthew N		Richard S. Ma		nce G. Melican	Derrek I. Ransford, CFA
Managing Director	Managing D		Managing Director	Managing		Managing Dire	Section Control to the Section Control	ng Director & Co-ClO	Managing Director
	r ie A. Ruddick aging Director	Wayne D. Smith Managing Dire		Veravanich ging Director	John T. Ruggier Director	i, CFA*	Mikael Sand, CFA [†] Director	Nicholas J. Sie Directo	
Kevin W. Bland Principal	Stefan GoettI† Principal	Bryan P. Nels Principa		Groot, CFA President	Jeffrey L. Buress* Sr. Vice President		hell T. Clemente Vice President	Wyatt H. Geiger, CFA Sr. Vice President	Justin C. Maney, CF Sr. Vice President
Srett W. Richardson, CFA Sr. Vice President	Jason K. Yu [‡] Sr. Vice President	Adam A. Bell Vice Presid		W. Croteau resident	Blessie Hwang, CFA Vice President		tthew T. Kahn ice President	Trisha Mandalia May Vice President	r [†] Veronica Milani [†] Vice President
Gina Park Vice President	Benjamin Pittsley* Vice President	Hiral G. Sava Vice Presid	dent Vice Pr	R. Spader* resident	John T. Carpenter Associate		ançois L. Casanova [†] Associate	Nicholas R. Faulkner Associate	Associate
Taylor V. Pijl Associate	Jack Pong [‡] Associate	Hunain R Associa	te Asso	M. Thompson ociate	Richard L. Wang Associate		nnie Z. McKinley nent Closing Manager	Timothy D. Berry, CAl Sr. Investment Analys	
Zakir S. Ghyaz Sr. Investment Analyst	Adrian J. Gonzalez Sr. Investment Analyst		t Analyst Sr. Investm		Dillon E. Jalbert* Sr. Investment Analyst	Sr. In	yan J. Lassen vestment Analyst	Ada N. Pospi [†] Sr. Investment Analys	,
William A. Belmont* Investment Analyst	Morgan A.L. Brokaw [*] Investment Analyst	Joseph R. H Investment A	2	N. Kardos A ent Analyst	Natthew Pandit, CFA Investment Analyst		/uhui M. Shi estment Analyst	Andrew J. Vanderscha Investment Analyst	ns Spencer M. Knight Monitoring Analyst
Clie	ent Services		Leg		Corporate Fund Acco		0.	pliance R	isk Managemen
		D +							
Gerard R. Branka* Sr. Vice President Ed Hoffman, CFA, FRI Sr. Vice President	Sr. Vice M Martin J.	Dreyer [†] President Wing, CAIA President	Ashok K. Tri Sr. Vice President & 8 Sta	General Counsel		ch, CPA (inact or & CFO Staff	Direc	. Best, CFA tor & CCO Staff	John Reynolds Sr. Vice President 1 Staff
Systems Adm	inistration	Sof	tware Develop	ment	Editori	al & Proc	duction	HF	& Admin.
Brian M. Le Vice President—Systems 5 Staff		Sr. Vice	Michael C. Long President—Software Dev 5 Staff	elopment		istopher M. Lo & Production M 5 Staff			vid J. Tosches ce President of HR 27 Staff
Note: Bold type denotes	Pathway partners. *F	Rhode Island staf	f. †London staff. ‡Hon	g Kong staff.					Z/ Stall





2021 Tactical Plan Review

At May 28, 2021

	2021 Plan	Actual to Date ^a
Commitments	\$200 million	\$127.4 million
Number of Investments	Up to 20 partnerships and up to 14 co-investments	12 primary partnerships, 10 co-investments, and 3 secondaries
Size of Investments	\$10-\$15 million (primaries)	\$8.6 million avg. commitment (primaries)
Investment Strategies	Buyouts, Venture Capital, Special Situations, Restructuring, and Co-investments	Buyouts (9), Venture Capital (2), Special Situations (4), Restructuring (0), Co-investments (10)

	2021 Plan		Commitments to Date ^a	
Strategy	No. of Inv.	Targeted Commitments (\$MM)	No. of Inv.	Commitments (\$MM)
Buyouts	Up to 10	Up to 125	9	56.1
Venture Capital	Up to 10	Up to 100	2	14.0
Special Situations	Up to 8	Up to 75	4	30.0
Restructuring	Up to 6	Up to 50	0	0.0
Co-investments	Up to 14	Up to 30	10	27.3
Total		Up to 200	25	127.4

Note: Amounts may not foot due to rounding.

all cludes investments that have been approved by Pathway's Investment Committee but have not yet closed.



Portfolio Overview

At December 31, 2020 (\$ in millions)

INCEPTION	2002
TOTAL COMMITMENTS a,b	\$3,046.2
NO. OF COMMITMENTS ^b	302
NO. OF MANAGERS ^b	78
% CONTRIBUTED	87%
WEIGHTED AVG. AGE (YEARS)	3.4
CURRENT COMPANIES	3,474
S-I NET IRR	15.4%
DPI	1.07x

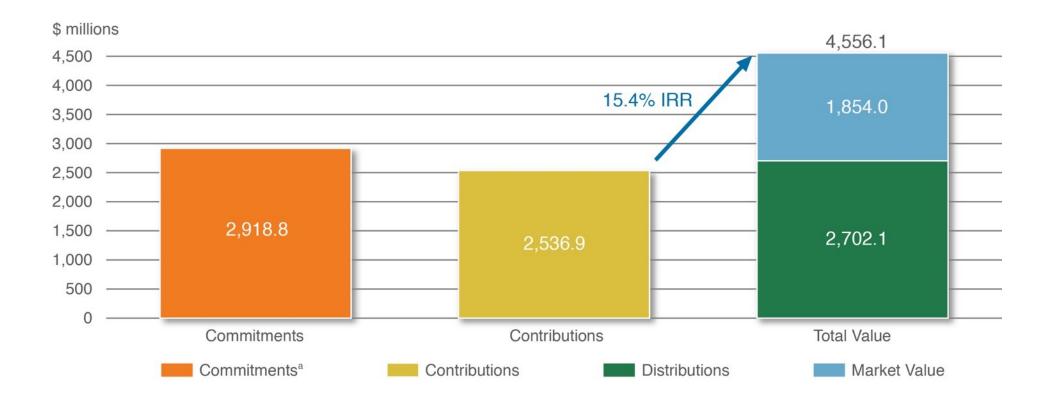
^aCommitments to non-USD-denominated investments are accounted for by multiplying unfunded commitments by the most recent quarter-ending exchange rate, then adding the result to cumulative capital contributions, causing commitments to non-USD-denominated investments to fluctuate quarterly.

blncludes commitments closed post-December 31, 2020, and commitments that have been approved by Pathway's Investment Committee but have not yet closed.



Performance Summary

At December 31, 2020

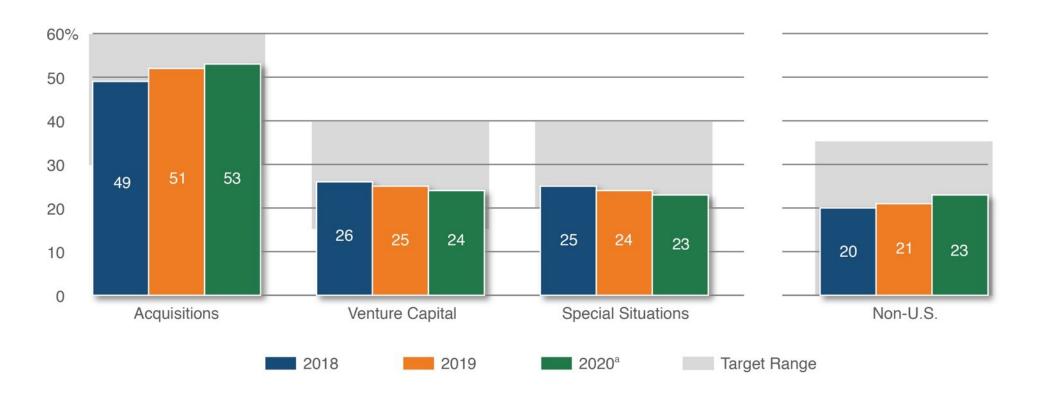


^aCommitments to non-USD-denominated investments are accounted for by multiplying unfunded commitments by the quarter-ending exchange rate, then adding the result to cumulative capital contributions, causing commitments to non-USD-denominated investments to fluctuate quarterly.



Investment Strategy Diversification

As a % of Partnership Market Value plus Unfunded Commitments At December 31, 2020



Note: Based on partnership market values and unfunded partnership commitments at December 31 of each year.

^aBased on partnership market values and unfunded partnership commitments at December 31, 2020, plus new commitments made or approved through May 28, 2020.



Portfolio Diversification

As a % of Company Market Value—3,474 Investments
At December 31, 2020

GEOGRAPHIC REGION STRATEGY INDUSTRY Other^a Construction Transportation Undisclosed Asia Acq.-Mega 2% Communications & Building Other^a Canada Other Software VC-Late Products UK & Services 16% Acq.—Large Europe (ex. UK) 4% 20% 5% Consumer Products: 6% 15% U.S.-West Infrastructure Energy-Related: 2% 24% Software 6% Finance, U.S.-Mid-Insurance VC-Early Atlantic Application & Real Estate 16% 5% Software -10% 21% Hardware U.S.-Midwest 4% 11% Distressed Debt **Industrial Products** 3% Acq.—Medium U.S.-Services Internet- & 31% Southwest Acq.-Small Online-Related U.S.-Northeast Medical U.S.-Southeast Manufacturing 13% 16% 14% 11% 8%

Notes: Acquisition substrategies are based on the following ranges of total enterprise values: Mega >\$10 billion, Large \$1-\$10 billion, Medium \$200 million-\$1 billion, and Small <\$200 million.

Excludes investments for which the general partners have not provided investment strategy classifications.

^aComprises agriculture-, forestry-, and fishing-related, as well as investments for which the general partners have not provided industry classifications.

^aComprises Africa, Australia, Central America, Mexico, the Middle East, and South America.

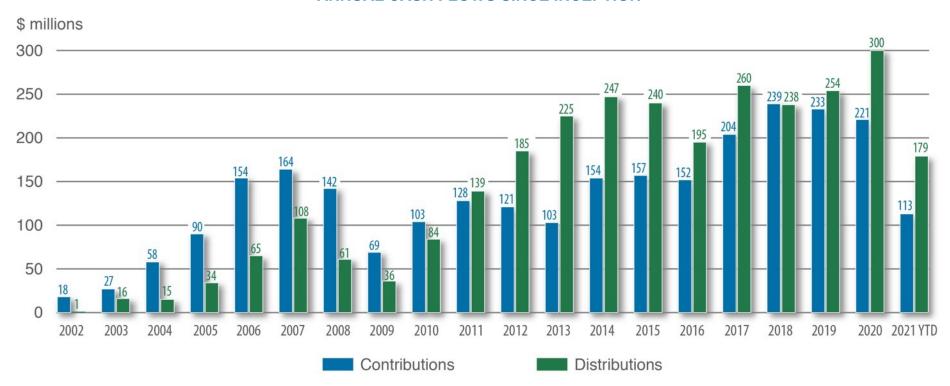
^bComprises investments for which the general partners have not provided geographic classifications.



Contribution and Distribution Activity

At May 28, 2021

ANNUAL CASH FLOWS SINCE INCEPTION



- Despite early headwinds from the COVID-19 pandemic, the portfolio distributed a record \$300 million during 2020.
- Distribution activity has continued to accelerate YTD 2021, already totaling \$179 million, as of May 28, 2021.
- The portfolio has remained cash flow positive in 10 of the past 11 years (including YTD 2021), during which it has generated positive cash flow of \$636 million.



Portfolio Performance

At December 31, 2020 (\$ in millions)

	No. of Investments	Commitments ^a	Contributions ^b	Distributions	Market Value	Total Value	Gain/ Loss	Since-Incep. Net IRR
Dec 31, 2020	278	\$2,918.8	\$2,536.9	\$2,702.1	\$1,854.0	\$4,556.1	\$2,019.2	15.4%
Dec 31, 2019	249	2,715.3	2,315.9	2,402.2	1,402.5	3,804.7	1,488.8	14.3%
YOY Change	29	\$203.5	\$221.0	\$299.9	\$451.5	\$751.4	\$530.3	1.1%

Note: Amounts may not foot due to rounding.

- During 2020, the ARMB portfolio generated a record 1-year return of 37.8% and a 1-year gain of \$530 million, which drove a 110-basis-point increase in the portfolio's since-inception net IRR during the year.
 - The portfolio was resilient despite the COVID-19 pandemic: the annual gain was more than double the prior high, representing a 109% increase from the previous record of \$254 million set in 2019.
 - Of the portfolio's 15 active vintage years (2006–2020), 11 posted 1-year returns in excess of 20%.
 - The portfolio outperformed the ARMB blended benchmark by more than 2,000 basis points.

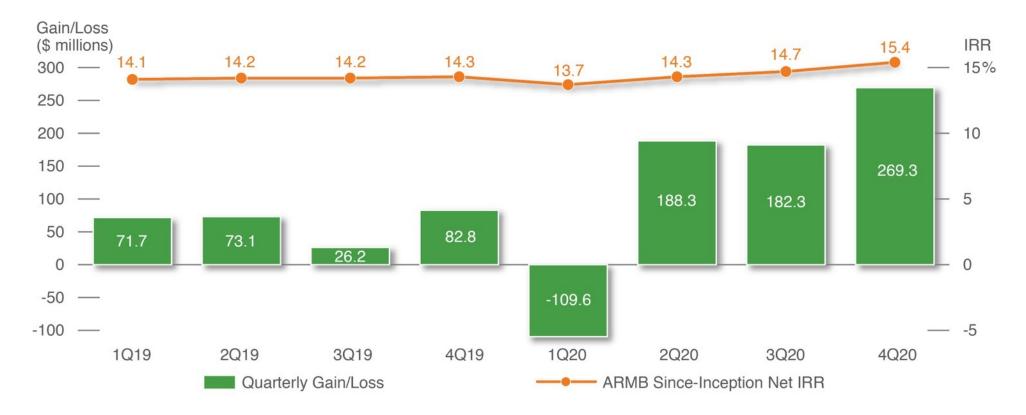
^aCommitments to non-USD-denominated partnerships are accounted for by multiplying the unfunded commitments by the quarter-ending exchange rate, then adding the result to cumulative capital contributions, causing commitments to non-USD-denominated partnerships to fluctuate.

^bIncludes capital contributed for management fees called outside the total commitment.



Recent Performance

At December 31, 2020



- Despite experiencing its first quarterly loss in more than 9 years in the first quarter of 2020, the portfolio rebounded sharply during the remainder of the year, generating its 3 largest quarterly gains since the inception of the program.
- The strong performance during 2020 increased the portfolio's since-inception net IRR to 15.4%, which exceeds the time-weighted return of ARMB's blended benchmark by more than 710 basis points.



Recent Significant Events within the ARMB Portfolio

ASTRA











IPO Pricings & SPAC Acquisitions

M&A Activity





























precisely









Co-investment Portfolio Overview

At May 28, 2021 (\$ in millions)

INCEPTION

ANNUAL TARGET

TOTAL COMMITMENTS

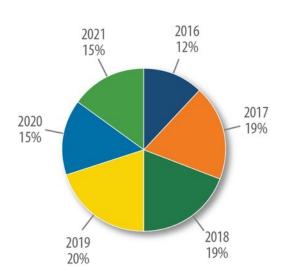
NO. OF COMMITMENTS

NO. OF MANAGERS

May 2016
Up to 15% of Annual Allocation
\$168.4
60
22

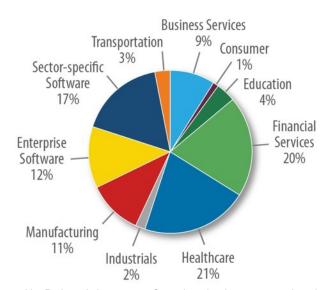
VINTAGE YEAR DIVERSIFICATION

As a % of Commitments



INDUSTRY DIVERSIFICATION

As a % of Commitments



Note: Reflects closed co-investment commitments and co-investment commitments that have been approved by Pathway's Investment Committee but have not yet closed.



Co-investment Portfolio Performance

At December 31, 2020 (\$ in millions)

Vintage Year	No. of Co-inv.	Commitments ^a	Contributions	Distributions	Market Value	Total Value	Gain/ Loss	S-I Net IRR
2016	6	\$19.5	\$17.1	\$21.6	\$19.1	\$40.6	\$23.5	42.2%
2017	9	27.1	25.0	7.4	37.9	45.3	20.3	19.3%
2018	12	36.4	35.4	1.7	60.6	62.3	27.0	25.8%
2019	14	35.0	33.7	18.8	52.4	71.2	37.5	78.3%
2020	10	23.2	22.7	_	25.5	25.5	2.9	16.6%
Total	51	\$141.2	\$133.9	\$49.5	\$195.5	\$245.0	\$111.1	32.9%
Realized & Public	8	\$25.2	<i>\$23.2</i>	\$45.1	\$19.6	\$64.7	\$41.5	65.3%

Note: Amounts may not foot due to rounding.

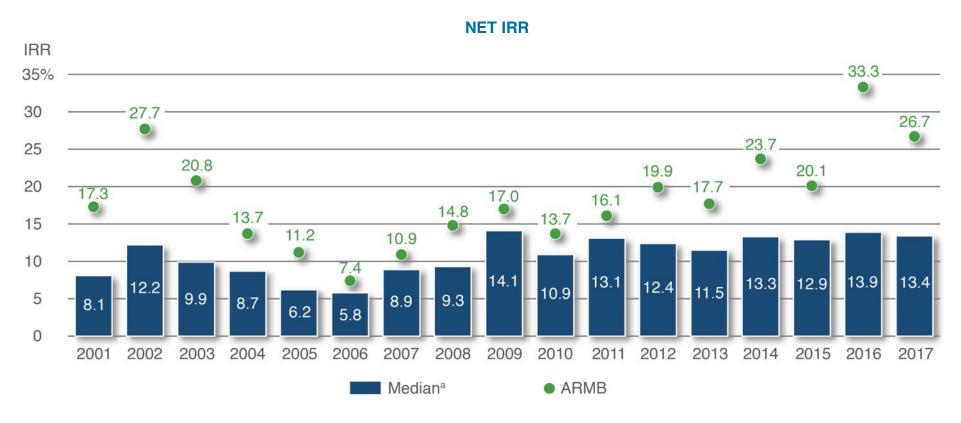
- The co-investment portfolio continued to generate strong performance during 2020, producing a 1-year IRR of 52.1%, which brought the co-investment portfolio's since-inception net IRR to 32.9%.
- Co-investments have generated an estimated management fee savings of \$5.7 million and carried interest savings of \$22.5 million for the ARMB portfolio.

^aCommitments to non-USD-denominated partnerships are accounted for by multiplying the unfunded commitments by the quarter-ending exchange rate, then adding the result to cumulative capital contributions, causing commitments to non-USD-denominated partnerships to fluctuate.



Vintage Year Performance vs. Industry Benchmarks

At December 31, 2020



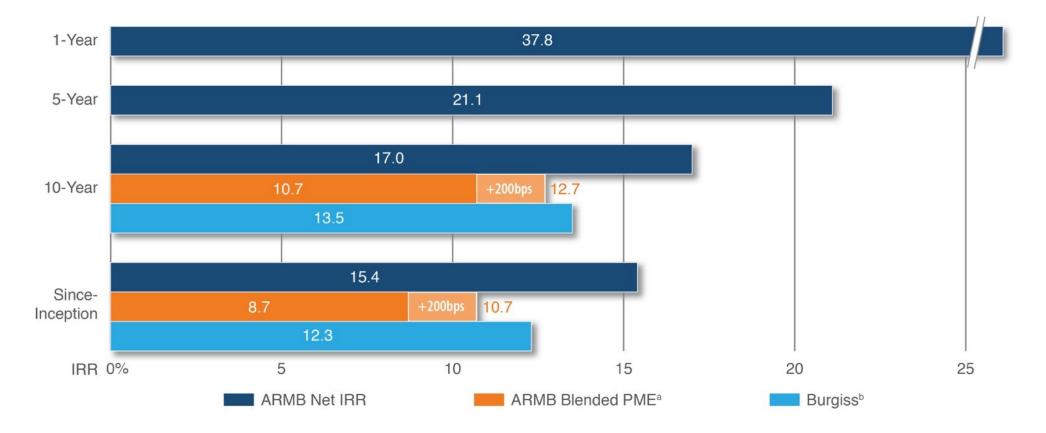
^aBurgiss Private iQ global all private equity median return benchmark, as of December 31, 2020, as produced using Burgiss data.

 All 17 of ARMB's more mature vintages (2001–2017) rank in the top half of performers for their vintages, collectively exceeding their median benchmarks by an average of 750 basis points.



Net Performance vs. Public and Private Market Indices

At December 31, 2020



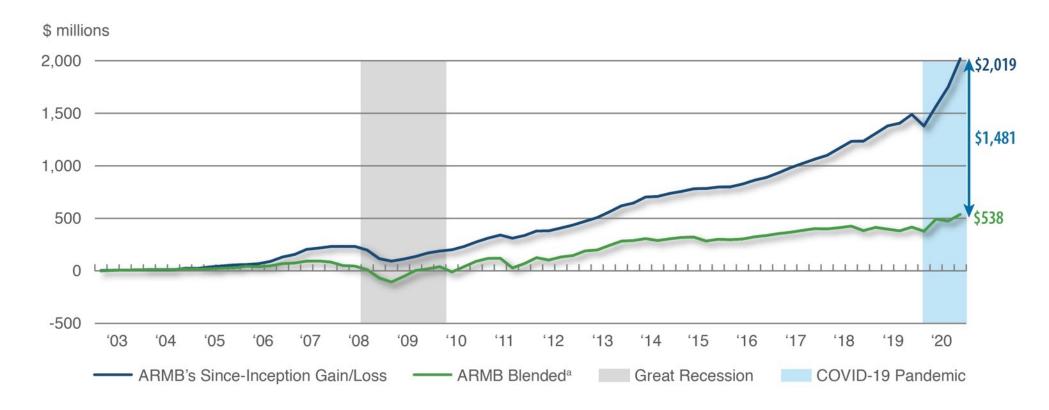
^aRepresents the dollar-weighted return of the ARMB blended benchmark (1/3 S&P 500, 1/3 Russell 2000, and 1/3 MSCI EAFE). Performance was derived by applying ARMB's cash inflows and outflows to the index's daily returns.

^bBurgiss Private iQ global all private equity pooled horizon return for 2001- through 2020-vintage funds, as of December 31, 2020, as produced using Burgiss data.



Historical Since-Inception Net Gain

At December 31, 2020



^aRepresents the dollar-weighted ARMB blended benchmark (1/3 S&P 500, 1/3 Russell 2000, and 1/3 MSCI EAFE). Excludes 200 basis point premium.

• The portfolio's outperformance of the ARMB blended benchmark has resulted in \$1.5 billion of incremental gains above the index since the program's inception.





SPAC IPO Issuance

- SPACs were first formed in the early 1990s, reached a peak in 2007 (\$12bn), then fell out of favor post-GFC.
- A confluence of events and market dynamics propelled SPACs into the forefront of U.S. equity markets in 2020.

SPAC IPO ISSUANCE



Source: Bloomberg.



SPAC Overview and Structure

SPACs provide an alternative path to the public markets for privately held companies.



Key Steps in the De-SPACing Process

1. SPAC IPO

 SPAC sponsor raises capital in an IPO through an offering of units, which consist of 1 common share and a fraction of a warrant (typically ½ to ¼ warrant).

2. SPAC Sponsor Searches for a Target

 Sponsors utilize their networks, relationships, and investment bankers to identify potential merger partners.

3. Merger Agreement

 Sponsors sign an LOI and work toward a definitive agreement with a target.

4. PIPEs and Forward Purchase Agreements

 Both PIPEs and Forward Purchase Agreements provide a backstop to meeting the minimum cash condition.

5. Proxy Statement/Shareholder Vote

- Following a definitive agreement, the SPAC must file an S-4/Proxy Statement with the SEC for its review.
- Following completion of a merger, the merger target begins trading as a publicly traded company.



What Is Driving the Surge in SPAC Issuance?

Supply

Attractive Sponsor Economics

 SPAC sponsors typically receive founder shares equivalent to 20% of the SPAC shares outstanding for nominal consideration.

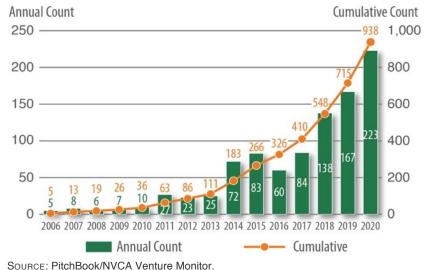
Risk-Free Arbitrage for SPAC IPO Investors

 IPO investors can choose to redeem their stock for the per-cash value held in trust account and keep their warrants, thus providing a risk-free option.

Platform Extension/Increase AUM

 SPAC sponsors, many of whom are investment managers, can increase their AUM and expand into different strategies by raising SPACs.

U.S. UNICORN POPULATION



Demand

Significant Number of Highly Valued Private Companies

• Over 900 unicorns as of the end of 2020.

Efficient Alternative Method of Going Public

 SPACs provide an alternative path to the public markets for private companies. The success of many 2020-vintage SPAC mergers has increased the number of companies considering this route.

Increased Quality of Sponsors and Targets

 SPAC sponsors now consist of "tier one" private equity firms, and merger targets include "prized" portfolio companies of both buyout and venture capital firms.

Strong Performance of Notable Post-IBC SPACs

 Strong performance of post-merger SPACs like Virgin Galactic and DraftKings has spurred significant interest from investors.

Strong Retail Investor Interest

- "Robinhood" effect.
- Perceived opportunity by retail investors to "get in on the ground floor" with a name-brand SPAC sponsor.

Source: Pathway Research.

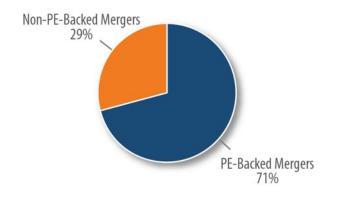


PE's Role in the SPAC Sector

- Private equity (buyout and venture capital) firms are a notable feature across the SPAC universe.
 - PE-backed companies accounted for 71% of all announced SPAC mergers in 2020.
 - Private equity firms accounted for 32% of all SPAC sponsors in 2020.
- A significant number of private equity firms raised their first SPACs in 2020 and in 1Q21.
 - E.g., Thoma Bravo, Ares, General Catalyst, Warburg Pincus, L Catterton, Industry Ventures

2020 SPAC M&A ACTIVITY

At December 31, 2020



NOTABLE PE-BACKED SPAC MERGERS ANNOUNCED IN 2020 AND IN 1Q21

Company	Deal Value (\$B)	Announced	Status
IronSource	11.1	Mar-21	Pending
MultiPlan	11.0	Jul-20	Completed
eToro Group	10.4	Mar-21	Pending
Paysafe	9.0	Dec-20	Completed
WeWork	9.0	Mar-21	Pending
Social Finance	8.7	Jan-21	Pending
Alight Solutions	7.3	Jan-21	Pending
CCC Information Services Group	7.0	Feb-21	Pending
Cazoo	7.0	Feb-21	Pending

Source: Bloomberg, Pathway Research, and Refinitiv.

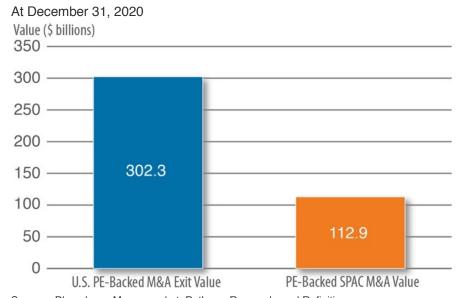
Source: Pathway Research.



Implications for Private Equity

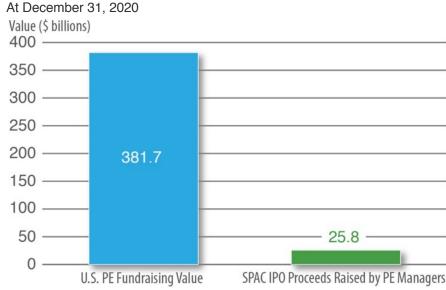
- SPACs offer an alternative path to liquidity and the public markets for PE-backed companies.
- "Pull forward" of exit timing and distributions for many PE-backed companies.
- PE firms are extending their platform and increasing AUM by sponsoring SPACs.
- SPACs are also a source of competition for PE firms:
 - Increased competition for M&A targets, particularly for growth equity—focused and pre-IPO-focused firms.
 - PE has always competed against the public markets.
- Potential conflicts of interest exist for PE firms that also sponsor SPACs.

U.S. M&A EXIT ACTIVITY ANNOUNCED IN 2020



Source: Bloomberg, Mergermarket, Pathway Research, and Refinitiv.

U.S. PRIVATE EQUITY FUNDRAISING ACTIVITY IN 2020



Source: Bloomberg, Pathway Research, and Refinitiv.





M&A and IPO Exit Markets

Global exit markets remained accommodative during the first quarter, allowing general partners to realize record-setting proceeds through a variety of exit paths.

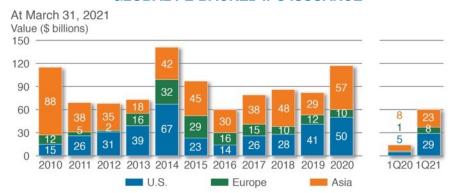
- Following a strong 2H20, M&A exit activity for PE-backed companies totaled \$203bn in 1Q21, a 116% increase from 1Q20 and the largest quarterly total on record.
 - Current market dynamics are favorable for sellers, and many general partners are reporting highly competitive sale processes involving both strategic and financial buyers.
- Highly receptive public investors and rich public market valuations encouraged many private equity firms to publicly list their portfolio companies.
 - Total proceeds raised by new offerings globally in 1Q21 totaled \$101bn, a more than 270% increase from 1Q20 and the largest quarterly amount on record.
- Special purpose acquisition companies (SPACs) continued to serve an active role as an exit option during 1Q21: 69 PE-backed companies announced mergers with SPACs during the quarter at a combined value of \$195bn, surpassing the full-year 2020 total by late February.

GLOBAL PE-BACKED M&A EXIT ACTIVITY



Source: Mergermarket and Pathway Research.

GLOBAL PE-BACKED IPO ISSUANCE



Source: Bloomberg, Renaissance Capital, and Pathway Research.



Buyout Markets

- U.S. buyout market activity continued to accelerate during 1Q21, building on the strong momentum garnered during the second half of 2020.
- U.S. buyout investment activity totaled \$125bn in 1Q21, an increase of 10% from the prior quarter and the largest quarterly amount since the \$225bn invested during 2Q07.
 - Activity was driven largely by 571 small- and middle-market investments announced during the quarter—the largest number on record.
 - Although European buyout activity was flat in 1Q21 compared with 1Q20, the €41.8bn aggregate transaction value is 39% above the quarterly average for the past 5 years.
- Average purchase-price multiples in the U.S. increased to 11.9x EBITDA in 1Q21, surpassing the prior peak of 11.5x EBITDA in 2019.
 - Entry multiples have remained relatively high due to the high proportion of technology-related buyouts in the marketplace.
- Buyout managers remain cautious overall due to the high level of competition, ongoing market volatility, and uncertain economic outlook.
 - GPs have continued to focus on resilient/defensive sectors such as technology and healthcare, opportunistic investments, and accretive tuckin acquisitions.

U.S. BUYOUT INVESTMENT ACTIVITY



SOURCE: Refinitiv, Pathway Research, and S&P LCD. ^aAverage PPM (as a multiple of trailing EBITDA) of all LBOs.

EUROPEAN BUYOUT INVESTMENT ACTIVITY



Source: Refinitiv, Pathway Research, and S&P LCD.

^aAverage PPM (as a multiple of trailing EBITDA) of LBOs with EV of €500 million or more.



Buyout Market Conditions Today vs. Prior Market Peak

Investment activity levels, financing structures, and fundraising activity highlight several structural differences in the buyout markets relative to 2007.

2007	2020	1Q21
9.7x	11.4x	11.9x
\$434 billion	\$241 billion	\$125 billion
8%	43%	41%
2.1x	3.4x	3.0x
6.0x	5.7x	6.4x
30.9%	43.0%	43.4%
\$187 billion	\$193 billion	\$30 billion
	9.7x \$434 billion 8% 2.1x 6.0x 30.9%	9.7x 11.4x \$434 billion \$241 billion 8% 43% 2.1x 3.4x 6.0x 5.7x 30.9% 43.0%

Note: Data provided for informational purposes only.

^{1.} Source: S&P LCD.

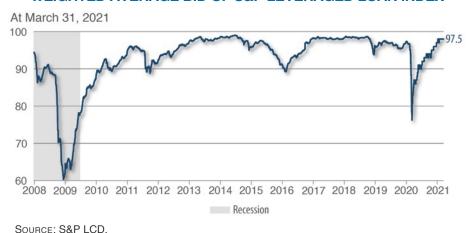
^{2.} Source: Refinitiv and Pathway Research. Fundraising amounts are based on net amounts raised, which are adjusted for fund-size reductions.



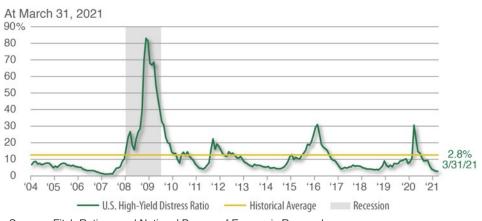
Private Credit Markets

- Indicators of distress have declined markedly since the pandemic-driven market sell-off in March 2020.
 - The distress ratio (percentage of high-yield bonds with spreads of 1,000bps or higher over U.S. Treasuries) declined from 30.6% at the end of March 2020—the highest level since February 2016—to 2.8% at March 31, 2021.
 - The U.S. high-yield default rate, a lagging indicator, declined to 4.9% at March 31, 2021. High-yield default volume continued to slow in 1Q21, totaling \$3.9bn in par value, down 57% compared with 4Q20.
- Secondary credit markets have stabilized following the pandemic-induced sell-off in March 2020.
 - The S&P Leveraged Loan Index generated a modest return of 1.0% in 1Q21.
 - The average bid for the S&P Leveraged Loan Index increased to 97.5% at the end of 1Q21, up from 96.2% at the end of 4Q20 and from a recent low of 76.2% in March 2020.
- The distressed debt opportunity has been limited to date, but many companies/sectors remain vulnerable.
 - An unprecedented level of fiscal and monetary stimulus has helped to stem losses in the credit markets; however, there remains significant uncertainty in the economic outlook.

WEIGHTED AVERAGE BID OF S&P LEVERAGED LOAN INDEX



U.S. HIGH-YIELD DISTRESS RATIO



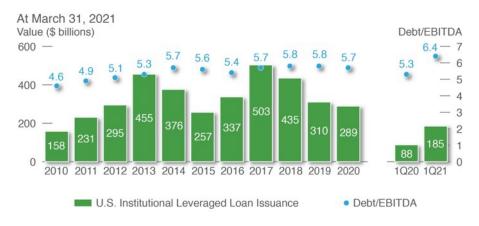
Source: Fitch Ratings and National Bureau of Economic Research



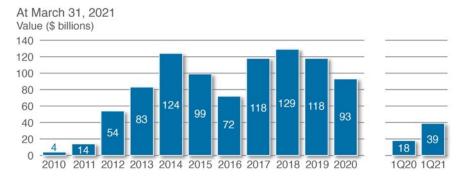
Private Credit Markets (continued)

- Non-investment-grade debt markets remain highly accommodative, helping fuel the strong pace of M&A and refinancing activity.
 - Institutional leveraged loan issuance totaled \$185bn in 1Q21, more than double the issuance in 4Q20 and the highest quarterly total on record.
 - U.S. high-yield bond issuance totaled a record \$149bn in 1Q21, an increase of 56% compared with 4Q20. The high-yield market has been fueled by support from the Federal Reserve and record investor inflows into high-yield funds and ETFs.
 - The yield to maturity of the S&P Leveraged Loan 100 Index ended March at 3.74%, down from 3.98% at the end of December.
- Quarterly leveraged loan activity was supported by a strong rebound in CLO fundraising activity and a rally in the secondary credit markets.
 - CLO issuance totaled a record-setting \$39.3bn in 1Q21, an increase of 120% compared with 1Q20.

U.S. INSTITUTIONAL LEVERAGED LOAN ISSUANCE



ANNUAL CLO ISSUANCE



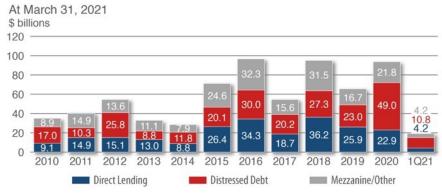
Source: S&P LCD. Source: S&P LCD.



Private Credit Markets (continued)

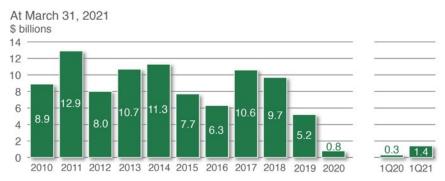
- The direct lending markets experienced robust new financing activity during 1Q21.
 - Buyout transaction activity hit a current-cycle high in 1Q21, driving an increase in financing opportunities for direct lenders.
 - Direct lending portfolios appear to have weathered the crisis relatively well overall; however, lenders with exposure to hard-hit industry sectors continue to prepare for adverse outcomes.
 - The lender-friendly environment that prevailed following the start of the pandemic was short-lived; spreads and leverage levels are now largely in line with pre-COVID levels.
- Private credit fundraising continues to be bolstered by an increase in distressed debt fundraising activity.
 - Distressed-focused funds raised \$10.8bn during 1Q21—an increase of 45% compared with the quarterly average over the past 5 years.
 - Distressed-related fundraising has increased as a result of both traditional distressed debt and opportunistic credit managers
 launching new funds to invest in opportunities arising from the pandemic. However, distressed-related investment activity has been
 relatively muted to date.

WORLDWIDE PRIVATE CREDIT FUNDRAISING ACTIVITY



Source: Refinitiv, PitchBook Data, Inc., and Pathway Research.

U.S.-SPONSORED MIDDLE-MARKET LEVERAGED LOAN BANK ISSUANCE



Source: S&P LCD.

Note: The middle market is defined as issuers with EBITDA of \$50 million or less.



U.S. Venture Capital

Technological advancements are driving opportunities in venture capital.

- Investment activity sky-rocketed in 1Q21; general partners have continued to deploy capital to both protect performing investments and provide them the capital needed to take advantage of new opportunities that have arisen from the crisis.
 - U.S. venture capital investment activity totaled \$62.1bn in 1Q21, the largest quarterly amount on record. Activity was driven by a record 184 mega-financings (i.e., deals with financing rounds of greater than \$100m), which accounted for approximately 64% of 1Q21 deal value.
 - Mirroring 2020, late-stage investment activity was significant, representing 42% of the first quarter's investment total.
- Amid strong public market performance, venture-backed IPO activity reached a quarterly high during the first quarter.
 - The 29 venture-backed IPOs during 1Q21 raised \$16.0bn, representing more than half of all venture-backed IPO proceeds in 2020.
- The rapid pace of innovation and adoption in multiple disciplines is driving returns and opportunities in venture capital.
 - The longer-term impact of COVID-19 could lead to further innovation and adoption of quarantine-proven business models, such as online learning, telemedicine, home fitness, and digital payments, which have garnered increased interest and support during the pandemic.

U.S. VENTURE CAPITAL—FUNDRAISING & INVESTMENT ACTIVITY



Source: PwC and CB Insights' MoneyTree™ Report, Refinitiv, and Pathway Research.

U.S. VENTURE CAPITAL—IPO ACTIVITY



Source: Bloomberg, Renaissance Capital, and Pathway Research.



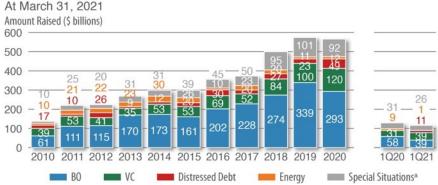
Private Equity Fundraising Activity

Fundraising activity remained strong in 1Q21, driven by continued demand for high-quality managers.

- Global PE fundraising activity has increased since 2009 as a result of attractive performance industry-wide and the continued expansion of the asset class, both by strategy and region.
 - Worldwide fundraising reached \$116bn during the quarter, a decline of 11% compared with 1Q20 but still strong based on historical levels.
 - Contrasting the decline in value, a record 510 funds held closes during the first quarter.
- The quarterly decline in activity was driven primarily by the lack of a true mega-buyout fund being raised during the quarter.
 - However, several prominent buyout funds, including Hellman & Friedman X (\$22.0bn target) and Genstar X (\$11.7bn), have closed or are expected to hold closes during 2Q21.
- Venture capital—focused fundraising was robust during the quarter, accounting for 34% of global activity.
 - Notable venture capital funds raised during the quarter include Bessemer Venture Partners XI (\$2.5bn) and Bond Capital II (\$1.9bn).

WORLDWIDE PRIVATE EQUITY FUNDRAISING

By Strategy



Source: Refinitiv and Pathway Research.

Notes: Fundraising amounts are based on net amounts raised, which are adjusted for fund-size reductions.

Amounts may not foot due to rounding.

^aComprises generalist, special situations, and other fund strategies not classified as buyout, venture capital–, distressed-, or energy-focused.

WORLDWIDE PRIVATE EQUITY FUNDRAISING

By Region



Source: Refinitiv and Pathway Research.

Notes: Fundraising amounts are based on net amounts raised, which are adjusted for fund-size reductions.

Comprises buyouts, venture capital, distressed debt, energy, and other fund strategies. Data is continuously updated and is therefore subject to change.



Biographies



James R. Chambliss Managing Director

Mr. Chambliss joined Pathway in 1994 and is a managing director in the California office. He is responsible for investment analysis and conducting due diligence on primaries, secondaries, and co-investments; negotiating and reviewing investment vehicle documents; and client servicing. Mr. Chambliss is a member of various Pathway committees, including the firm's Management Committee, Investment Committee, and Co-investment Investment Subcommittee. Mr. Chambliss also serves on the advisory boards of several private market partnerships.

Mr. Chambliss received a BS in business administration, with an emphasis in finance, from Loyola Marymount University and an MBA from the Marshall School at the University of Southern California.



Canyon J. Lew Managing Director

Mr. Lew joined Pathway in 2004 and is a managing director in the California office. He is responsible for investment analysis and conducting due diligence on primaries, secondaries, and co-investments; negotiating and reviewing investment vehicle documents; and client servicing. Mr. Lew is co-head of Pathway's co-investment team and is a member of the firm's Co-investment Investment Subcommittee. Mr. Lew also serves on the advisory boards of several private market partnerships.

Prior to joining Pathway, Mr. Lew worked for Fleet Fund Investors as an associate, where he monitored investments within Fleet Bank's private equity portfolio and reviewed new investment opportunities. Mr. Lew received an AB in economics and engineering from Brown University and an MS, with high honors, in investment management from Boston University.



Biographies (continued)



Wyatt H. Geiger, CFA Senior Vice President

Mr. Geiger joined Pathway in 2014 and is a senior vice president in the California office. His responsibilities include investment analysis and conducting due diligence on primaries, secondaries, and co-investments; investment monitoring; performance analysis; client reporting; and client servicing. Mr. Geiger is also a member of Pathway's market research team. He received a BS in business administration from the University of Southern California. Mr. Geiger is a CFA charterholder.



Pathway Contact Information

California

Pathway Capital Management, LP 18575 Jamboree Road, 7th Floor Irvine, CA 92612

Tel: 949-622-1000

Ed Hoffman-Senior Vice President Martin Wing-Senior Vice President

Hong Kong

Pathway Capital Management (HK) Limited Champion Tower, Level 44 3 Garden Road Central, Hong Kong

Tel: +852-3798-2580

Simon Lau-Managing Director

Rhode Island

Pathway Capital Management, LP 500 Exchange Street Suite 1100, 11th Floor Providence, RI 02903

Tel: 401-589-3400

Jerry Branka-Senior Vice President

Tokyo

Strategic Alliance With Tokio Marine Asset Management Co., Ltd. Tekko Buildina 1-8-2 Marunouchi Chiyoda-ku, Tokyo 100-0005 Japan

Tel: +81 (0) 3 3212 8103

Soichi "Sam" Takata-Head of Private Equity

London

Pathway Capital Management (UK) Limited 15 Bedford Street London WC2E 9HE

Tel: +44 (0) 20 7438 9700

Alex Casbolt-Managing Director

Website

pathwaycapital.com





The Fed's Not Concerned About Inflation. Should You Be?

Inflation Webinar

May 25, 2021

Jay Kloepfer Capital Markets Research Jim Van Heuit Capital Markets Research

Why Isn't the Fed Worried?

Statement on longer-run goals and monetary policy strategy

The Fed Funds rate can be relatively lower without sparking too much inflation

- "The [Federal Open Market] Committee judges that the level of the federal funds rate consistent with maximum employment and price stability over the longer run has declined relative to its historical average."
- The Fed Funds rate is low but not too low.

Some inflation above the target is OK

- "[F]ollowing periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time."
- The Fed not only thinks that inflation will rise above 2% but wants it to (at least for a limited period of time).

The Fed can control restrain inflation

- "The inflation rate over the longer run is primarily determined by monetary policy."
- If inflation rises too high or remains above 2% for too long the Fed can bring it back down.

The Fed is not saying that there won't be inflation, just that moderately higher inflation is helpful and inflation can be controlled if it gets too high for too long.

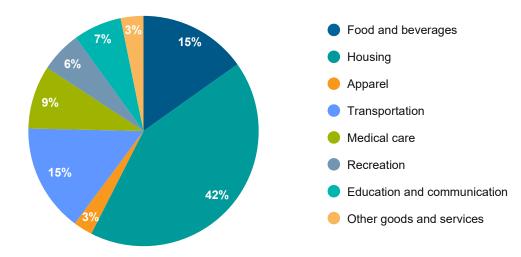


Should You Be Worried?

Impact of inflation on institutional investors

- Increases in costs directly tied to CPI
 - Cost-of-living adjustments (COLAs)
- Mission funding
 - CPI more relevant if mission is related to housing
 - CPI less relevant if mission is related to education
 - General CPI can seep into smaller categories
- Different investments respond differently to inflation
 - Different sources of inflation
 - Inflation timing

Relative Importance of Components in CPI



Source: U.S. Bureau of Labor Statistics

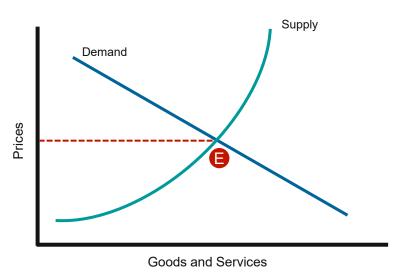


The Mechanics of Inflation

No inflation at price equilibrium

- Price determines amount of goods and services
 - The lower the price the more consumers want
 - The higher the price the more companies will produce
- Prices adjust so that amount of goods and services produced = amount of goods and services consumed

Price Determination



Source: What are some of the factors that contribute to a rise in inflation? https://www.frbsf.org/education/publications/doctor-econ/2002/october/inflation-factors-rise/

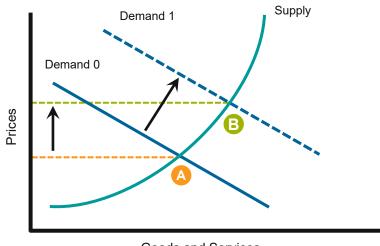


The Mechanics of Inflation

Demand-pull

- Aggregate demand for goods and services rises independently of prices
- Can be driven by fiscal stimulus or rapid increases in the money supply

Demand-pull Inflation



Goods and Services

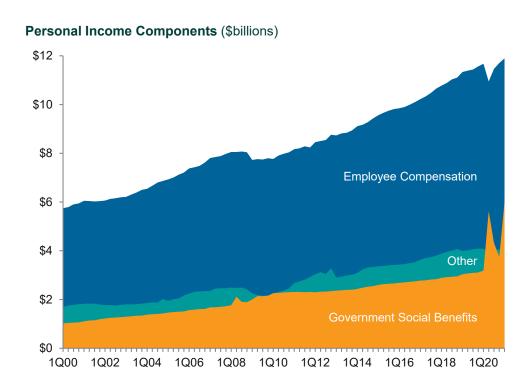
Source: What are some of the factors that contribute to a rise in inflation? https://www.frbsf.org/education/publications/doctor-econ/2002/october/inflation-factors-rise/



Historic Fiscal Stimulus

Short-term jolt to personal income

- Stimulus provided to offset decline in employment compensation due to lockdowns
- Stimulus greater than lost income
- Stimulus exceeded that provided during the Global Financial Crisis
- Inflationary impact depends on what recipients do with the money



Source: U.S. Bureau of Economic Analysis

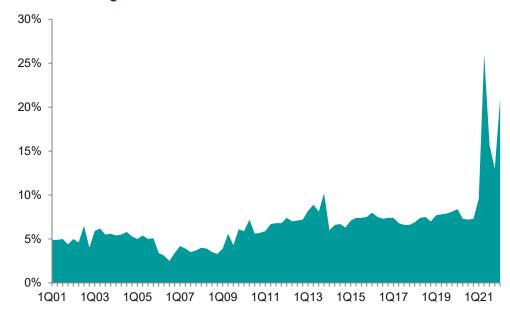


Personal Savings Skyrocketed

What happens when the economy opens up?

- Stimulus checks were widely dispersed
 - Flat amounts
 - Limited income dependence
 - Independent of employment status
- Lockdowns limited the ability to buy
- Many recipients increased savings
- Inflationary impact depends on whether savings reflects long-term strategy or pent-up demand

Personal Savings Rate as Percent of Personal Income



Source: U.S. Bureau of Economic Analysis



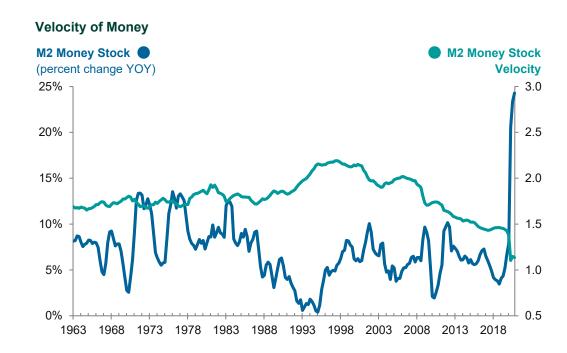
Unprecedented Growth in Money Stock

Dramatic reduction in velocity restrains short-term inflation

 Monetary theory states that the product of the money stock and the velocity of money should equal the product of the prices of goods and services and their quantities

Money Stock x Velocity

- = Price x Quantity of Goods & Services
- If the velocity of money and the quantity of goods and services stay the same then an increase in money stock should lead to inflation
- Money stock has increased dramatically but velocity has unexpectedly dropped to historic lows



Source: Board of Governors of the Federal Reserve System, Federal Reserve Bank of St. Louis

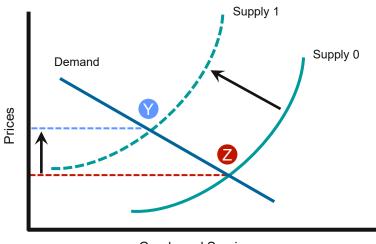


The Mechanics of Inflation

Cost-push

- Aggregate supply of goods and services decreases independently of prices
- Wage increases
- Input prices

Cost-push Inflation



Goods and Services

Source: What are some of the factors that contribute to a rise in inflation? https://www.frbsf.org/education/publications/doctor-econ/2002/october/inflation-factors-rise/

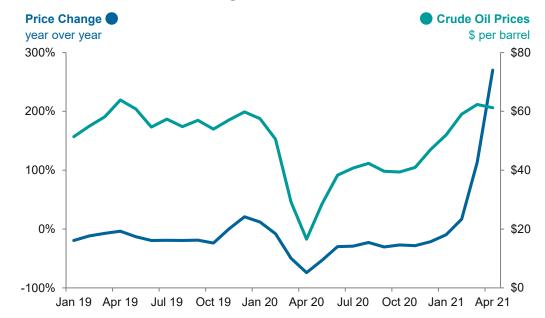


Crude Oil Inflation to Drive Inflation Higher?

Prices have jumped, but from extreme lows

- Crude oil prices have spiked since the fall of 2020
- Mind the base!
 - \$64 in April 2019
 - \$17 in April 2020
 - \$60 in April 2021
 - Increases in the last year have been high on a percentage basis but price about even with 2 years ago

Crude Oil Prices and Price Change Year Over Year



Source: U.S. Energy Information Administration

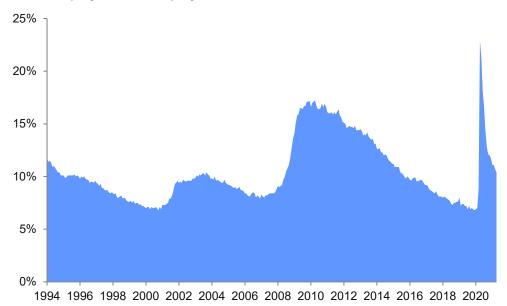


Impact of the High Jobless Rate

Uncertain long-term impact

- Unemployment continues at high levels
- Potential causes
 - Concern about pace of reopening
 - Skills mismatch
 - Relatively high government benefits
- Short-term conditions and long-term implications
 - Incentive wages
 - Compensation "anchor"

U-6 unemployment Unemployment



Source: U.S. Bureau of Labor Statistics

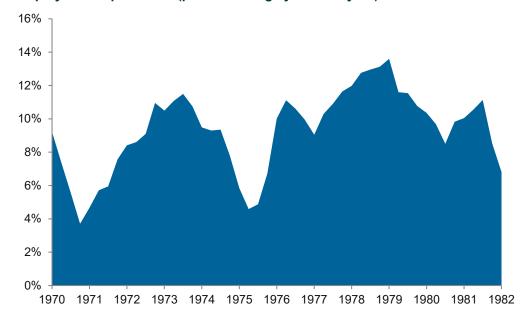


Back to the Future?

Rising employee compensation large contributor to inflation in the 1970s

- Upward Cycle
 - Increasing costs lead to higher wage demands
 - Increasing wage demands lead to higher costs
- Ability to get higher wages
 - Demand for skilled work force
 - Unionization
 - Lower level of global infrastructure

Employee Compensation (percent change year over year)



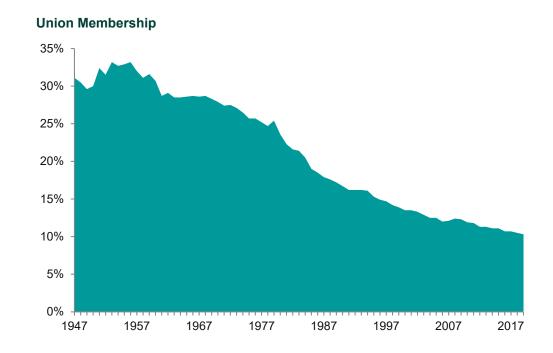
Source: U.S. Bureau of of Labor Statistics



The Role of Unions

Decline in membership diminishes impact on compensation

- Unions have been a major force in blue-collar compensation
- Impact of unions has fallen
 - Declining industrial base
 - Increasing service economy



Source: Economic Policy Institute

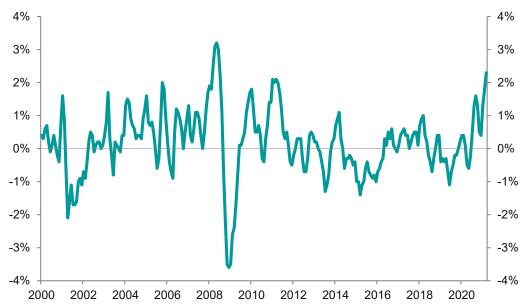


Another Factor: Imports

Trade friction and pandemic may change dynamic

- Imports are a substitute for domestic resources
 - Foreign products cheaper
- Threat to continued operations
 - Pre-pandemic trade restrictions
 - Pandemic lockdowns
 - Supply chain kinks
 - How will recent experience impact future plans?





Source: U.S. Bureau of Labor Statistics

Monthly import price index for BEA End Use EXPET, all imports excluding petroleum, not seasonally adjusted

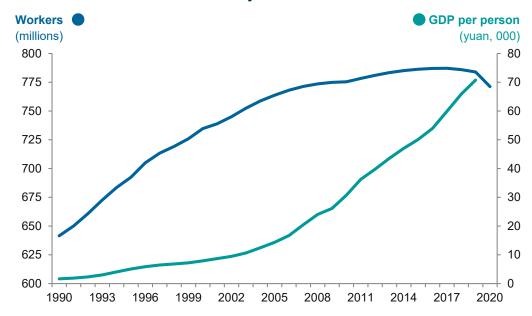


Magnitude of Threats to Low "Imported" Inflation

Labor force and productivity control costs

- Low-cost foreign labor a frequently cited reason for low inflation
 - Manufacturing often done in inexpensive labor markets
- Demographic headwinds
 - Are population growth and urbanization in China reaching limits?
- Productivity tailwinds
 - More expensive workforce offset by increasing productivity in emerging markets

Chinese Labor Force and Productivity



Sources: Organisation for Economic Co-operation and Development, The World Bank, International Labour Organization

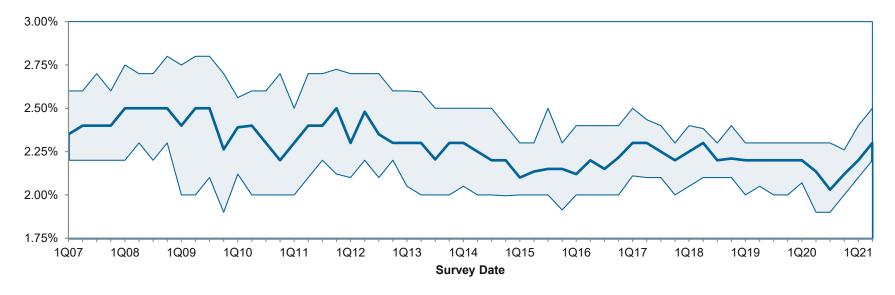


Outlook for Inflation

What professional forecasters are projecting

Projections for the 10-Year Annual-Average Rate of Personal Consumption Expenditure (PCE) Inflation

Median and Interquartile Range)



Source: Federal Reserve Bank of Philadelphia



Outlook for Inflation

What the people on the street are expecting

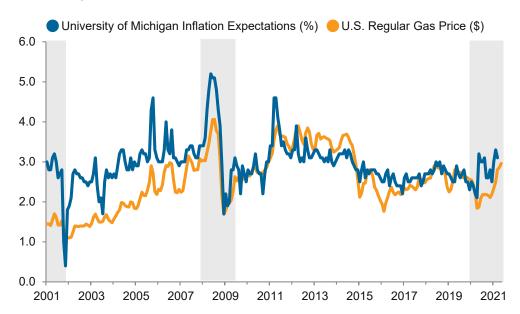
The real concern about inflation expectations is that they become unanchored.

Everyday experiences can guide ordinary people.

"Consumers set their inflation expectations by simply looking at gas prices ..."

— Paul Krugman

Inflation Expectations



U.S. recessions are shaded; most recent end date is undecided Source: Federal Reserve, University of Michigan, and the U.S. Energy Information Agency



Callan's 10-Year Capital Market Assumptions 2021–2030

Inflation to average 2% over the next 10 years – an increase over the recent past

Asset Class	Projected Return*	Projected Risk		
Equities				
Broad U.S. Equity	6.60%	17.95%		
Global ex-U.S. Equity	6.80%	20.70%		
U.S. REITs	6.25%	20.70%		
Natural Resources Equity	6.10%	23.60%		
Global Listed Infrastructure	6.30%	21.50%		
Fixed Income				
Core U.S. Fixed	1.75%	3.75%		
TIPS	1.70%	5.05%		
Bank Loans	4.30%	9.15%		
Alternatives				
Core Real Estate	5.75%	14.10%		
Private Infrastructure	6.00%	15.45%		
Private Equity	8.00%	27.80%		
Commodities	2.25%	18.00%		
Cash Equivalents	1.00%	0.90%		
Inflation	2.00%	1.50%		

^{*10-}Year Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).



Why Real Assets?

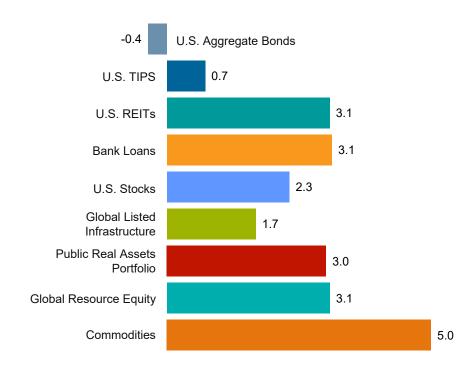
- Potential hedge for inflation-driven liabilities and commitments
 - Defined benefit plans (active liabilities, COLAs)
 - Health care liabilities
 - Endowments, foundations
 - Defined contribution investors (target date funds)
- Real assets are deemed inflation-sensitive because:
 - Cash flows and replacement costs will ultimately adjust for inflation
- Potential hedge against losses in rising or high inflation scenarios
 - Sharply rising inflation will cause short-run to intermediate-run underperformance in equities and bonds (potentially severe)
- Provide diversification benefits in low-inflation environments
- Create additional potential for alpha-generation by active managers



Inflation Betas - Stocks, Bonds, Real Assets

Relative to CPI All Urban for 15 years ended December 31, 2020

- Inflation beta is a measure of the responsiveness of an asset's returns to observed changes in inflation
 - One dollar worth of commodity investment has the potential to provide five dollars worth of inflation hedging
- Real assets tend to exhibit positive inflation betas while nominal assets tend to exhibit negative inflation betas
- Classic "Public Real Assets Portfolio" Benchmark:
 - 25% Bloomberg TIPS
 - 25% Bloomberg Commodities Total Return
 - 25% S&P Select REITs
 - 25% S&P Global Natural Resources

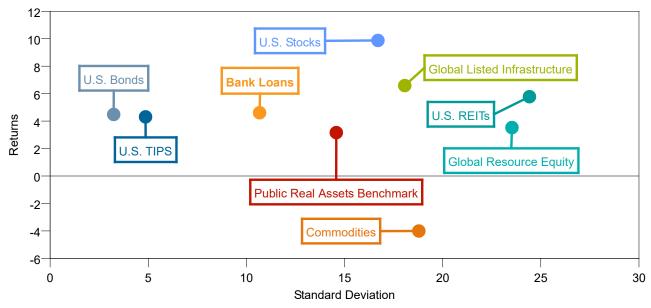




Risk vs. Return - Real Assets Benchmarks (15 Years)

Real assets have been disappointing in a bull equity market

Return vs. Standard Deviation



Data as of December 31, 2020 Sources: Bloomberg, Bloomberg Barclays, Callan, Standard & Poor's,



Real Assets Have Been Challenged to Keep Up With the U.S. Stock Market

Diversification delivered by real assets, but at the cost of lower return

	5 Years	10 Years	25 Years
U.S. Equity			
Russell 3000	16.64	13.79	9.71
Global ex-U.S. Equity			
MSCI ACWI ex USA Small Cap	10.40	6.32	6.51
Fixed Income			
Bloomberg Barclays Aggregate	3.10	3.44	5.09
Bloomberg TIPS	1.62	10.99	5.08
90-day T-Bill	1.19	0.63	2.22
Alternatives			
NCREIF Property	5.81	8.82	9.06
FTSE Nareit Equity	5.33	8.56	9.92
CS Hedge Fund	5.12	3.88	7.20
Cambridge Private Equity*	17.10	14.73	15.41
Bloomberg Commodity	2.31	-6.28	0.97
Gold Spot Price	6.78	1.77	6.01
Inflation - CPI-U	2.15	1.71	2.15

^{*}Cambridge PE data through 09/30/20; CS Hedge Fund Index data through 9/30/20 Sources: Bloomberg, Bloomberg Barclays, Callan, Cambridge, Credit Suisse, FTSE Russell, MSCI, NCREIF, S&P Dow Jones Indices.



First Principles for Inflation Protection in a Long-Term Investment Portfolio

How will inflation protection change as inflation risks evolve?

Three core principles guide Callan's construction of portfolios with the explicit goal of providing inflation sensitivity:

- Should provide diversification relative to traditional public equity and fixed income asset classes
- Seek sensitivity to near-term movements in price levels
- Positive returns, in real terms, over longer periods = long-term inflation protection

The investor's objectives for the portfolio determine its structure and explicit exposures to real assets. Key considerations:

- Time horizon
- Level of diversification
- Return target

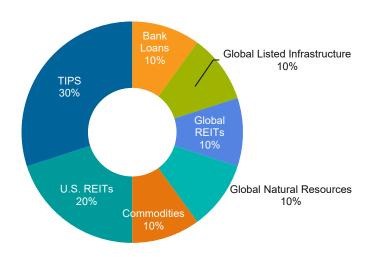
Anchor to real assets portfolios in institutional portfolios is direct (private) real estate (50%–100%)

 Can be augmented by other real assets exposures that may be public (TIPS, commodities, inflation-sensitive equity) or private (infrastructure, energy)



Evolution of Real Assets Portfolio Construction

Example: Callan Client
Custom Real Assets Implementation
Public DB plan



- Active and passive implementation
- Diversified real assets portfolios are often complements to private real estate/private real assets exposures:
 - 8% private real estate, 7% diversified real assets, 15% total
- Other asset classes considered but not selected for this portfolio: private infrastructure, private energy.



Rethinking Real Assets Portfolios

Have the sources of inflation uncertainty changed?

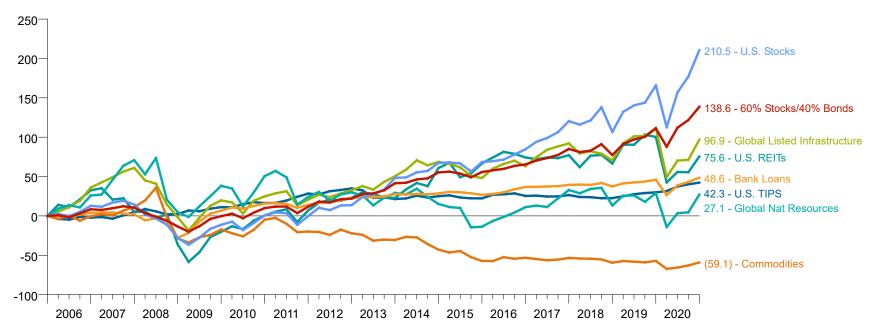
- Outside of real estate, the primary focus for real assets exposures has been on commodity- and natural resource-driven inflation risks
 - Source of many historical short-term price spikes
 - Commodities show the highest beta to inflation and can be tremendous diversifiers to bonds and equities.
 - Commodities were a good inflation hedge in the 1970s, surpassing equities and inflation.
 - But at a great opportunity cost since then ... commodities produce no cash flows and have not produced compelling long-term returns.
 - What will a commodity recovery look like in a post-pandemic, climate-aware policy environment?
 - Inflation-sensitive equities provide an explicit equity beta underneath natural resource exposures.
- In the long-term TIPS have been an effective hedge for inflation.
 - But in the short term TIPS respond more to movements in interest rates and inflation expectations than actual inflation.
 - The long-term inflation hedge comes at the cost of low long-term returns, and represents a substantial exposure to real interest rate risk.
- Best protection long term: stocks provide a strong opportunity to generate a positive real return and outperform inflation.



Cumulative Relative Returns vs. Inflation – Real Assets Benchmarks

Need a tilt toward equity to consistently outperform inflation

Cumulative Relative Returns Relative to Inflation for 15 Years Ended December 31, 2020







- Theory indicates that pandemic-related government actions should lead to inflation
- In reality the inflation picture is much murkier
- In a strong economic recovery, with the current low interest rate environment, inflation will further erode weak bond returns



The Callan Institute's mission is to improve the best practices of the institutional investment community through research, education, and dialogue.

Follow us for notifications about our latest research and events



Twitter: @CallanLLC



LinkedIn: Callan

ALASKA RETIREMENT MANAGEMENT BOARD

Revisiting Index Futures as Portfolio Management Tools

Key Board Decisions

Determine Investment Objective

- Fund's Purpose
- Governance who makes which decisions?

Determine Asset Allocation

- Strategic
- Tactical

Oversee Implementation

- Manager Structure number and types of manager allocations.
- Manager Selection

Monitor Results

- Are the fund, asset classes and mandates performing as expected?
- Are they achieving objectives?

Uses of futures

- Futures offer a means for either *speculating* or *hedging* exposures underlying the contract:
 - Speculating via an investment (long or short) in the underlying commodity or index that adds to economic exposure
 - Hedging via putting on contracts that reduce overall economic exposure(s)
- For institutional investors, futures have several uses mainly relating to hedging:
 - Equitizing cash balances
 - Porting alpha to other base sources of investment exposure
 - Rebalancing
 - Tactical
 - Strategic

About futures

- How they work:
 - Investor maintains small collateral margin account (e.g., US T-Bills)
 - Using margin account, investor can execute and maintain long or short positions in specific futures contracts subject to margin requirements
 - Daily cash flows to/from investor based on daily mark-to-market of position
 - Contracts expire, generally on a quarterly basis
 - At expiration, futures contract price settles, converging with spot price of underlying
 - If investor desires to maintain futures exposure beyond expiration date, then investor will *roll* expiring contract into next contract prior to expiration

About futures (cont.)

Observations:

- In certain markets, futures are *extremely liquid* (e.g., S&P 500, 10yr Treasury Notes)
 - Futures have found wide use among investors for hedging economic exposures and equitizing cash balances
 - Costs of transacting in liquid futures are low
- Clearinghouse structure and daily mark-to-market of futures mitigates potential counterparty risk issues
- To utilize, need tools to integrate and monitor futures risk positions with cash investment portfolio risks

ARMB staff experience with futures

- Used in several past ARMB programs including:
 - Portable Alpha (2016 2019)
 - Cash Equitization (2016 2019)
- Previous programs wound down as overall ARMB equity exposure transitioned to being increasingly passive
- Additional staff prior experience using futures includes:
 - S&P 500 futures to *equitize* long/short equity market neutral strategy
 - Eurodollar interest rate futures to hedge interest rate risk in asset-liability book
 - Currency futures to hedge corporate foreign exchange risk
 - Gold futures to hedge natural resource investments exposure to gold

Current state of ARMB staff authorizations

ARMB Domestic and International Equity Guidelines

- Allows for use of equity related derivatives if allowed in manager contract or fundamental to the strategy
- Futures and options allowed for implementing portfolio reallocation to gain immediate exposure to appropriate country weighting
 - Must be traded on exchange or with AA rated counterparts if OTC; contracts can't exceed 12 months
 - Futures and options can't be used to leverage the portfolio
 - All futures and options positions must be reported to ARMB each month
- Purchases of commodities futures is prohibited

ARMB Fixed Income Guidelines

- Allows total return swaps referenced to components and sub-components of fixed income indices
- Investment mangers are not permitted to use options or futures

2016 Board Action

- ARMB authorized staff to use futures and swaps referencing Russell 1000, Russell 2000 and S&P 500 as portfolio tools. At that time, potential uses included:
 - Cash equitization
 - Portable alpha
 - Transition management
 - Portfolio rebalancing

Managing plan level tracking error

Background:

- Overall ARMB asset allocation weight targets and upper/lower bounds are set annually
- As investment returns evolve, actual portfolio asset class weights can drift from target
- Plan benchmark assumes rebalancing back to target at each quarter's end
- Plan asset weights differing from benchmark weights implies tracking error at plan level

Managing plan level tracking error (cont.)

- To manage plan level tracking error, staff maintains portfolio weights consistent with approved targets and bounds by rebalancing underlying mix of assets generally quarterly, moving asset class weights closer to current benchmark target weights
- Existing rebalancing approach generally takes 1-2 weeks to effect rebalancing, given complexity of process and needed linkages of cash settlement to various trades
- Time lag in rebalancing plan assets back to benchmark targets induces tracking error
- Tracking error issues have become more acute in recent years as sudden jumps in return volatility have occurred with increased frequency
- Proposed solution: utilize futures as tactical tool for rebalancing
 - Compress rebalancing time lag
 - Reduce plan tracking error

Futures as tool in tactical rebalancing

Rebalancing process:

- Identify desired asset class weight changes
- Identify significant weight changes that cannot be made quickly
- Consider proxy weight changes that can be made initially in futures, then subsequently in underlying cash assets
- Execute trades in some underlying assets and some futures to move plan asset weights closer to new rebalanced target
- Subsequently, adjust futures allocations as underlying assets approach respective targets

Benefits:

- De-linking of trades across asset classes from cash settlements, allowing economic exposures to be changed quickly
- Broad economic exposures can be changed with small numbers of trades in futures, allowing more time for underlying positions involving many trades to be done
- Compressing the timeframe around rebalancing economic exposures reduces plan tracking error

Example of tactical rebalancing

- Assume a quarter where illiquid assets cannot be rebalanced
- Assume a dramatic quarter of asset returns similar to 1Q2020
- Rebalance liquid assets to minimize tracking error of resulting portfolio to target weights

Liquid Assets					Illiquid Assets					
		Global			i					
	Domestic	ex-US	Invetment	Cash	REITs	Core	Farmland	Timber	Private	Inflation
	Equity	Equity	Grade			Real Estate			Equity	Sensitive
Target weights	0.30	0.21	0.21	0.01	0.01	0.05	0.03	0.01	0.14	0.02
Example returns	-20.9%	-24.1%	3.2%	0.6%	-23.4%	0.8%	-0.1%	0.1%	-7.8%	0.4%
Pre-rebalance weights	0.27	0.18	0.25	0.01	0.01	0.06	0.04	0.01	0.15	0.03
Post-rebalance weights	0.29	0.20	0.22	0.00	0.01	0.06	0.04	0.01	0.15	0.03
Weight changes to make	0.02	0.02	-0.03	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Dollar changes (\$BB)	0.634	0.696	-0.936	-0.418	-0.070	0.000	0.000	0.000	0.000	0.000

Example of tactical rebalancing (cont.)

- Trades we need to do:
 - Buy \$634MM of Domestic Equity in 4 internal equity portfolios
 - Buy \$696MM of Global ex-US Equity among 8 external equity managers
 - Sell \$1.4BB of fixed income (Investment Grade and Cash) from 2 internal fixed income portfolios
 - Sell \$70MM of REITs from 1 internal equity portfolios
- Without using futures the process would include:
 - Send 8-12 Letters of Direction to external managers and custodian
 - Execute the following trades:
 - 135 fixed income sell trades (over 1 week)
 - 2,116 equity buy trades (as cash comes in from fixed income sales)
 - 159 REITs buy trades (as cash comes in from fixed income sales)

Example of tactical rebalancing (cont.)

- Using futures as a tool we could:
 - Change broad equity and fixed income exposures in 1 day with trades in 5 futures contracts, shorting Treasury futures and buying equity futures
 - Send 8-12 Letters of Direction to external managers and custodian
 - Complete underlying fixed income sale trades and equity buy trades over subsequent week, covering Treasury futures contracts and selling equity futures

Benefit:

- Broad equity and fixed income exposures changed very quickly and simultaneously
- Lower tracking error to plan benchmark
- Relieves potential pressure to sell large amounts of fixed income and buy large amounts of equities within compressed timeframe

Cost:

- Commissions and liquidity cost of futures positions (small)
- Basis risk between underlying asset classes and futures (small)

Tracking futures positions

Need to monitor:

- Notional value of futures contracts held
- Margin requirements (initial and ongoing)
- Integrated economic risk/tracking error combining futures with cash asset positions
- Possible leverage induced by futures
- Daily mark-to-market on futures positions
- Futures-augmented plan performance

Operational aspects

- For tactical rebalancing use of futures:
 - Utilize sub-accounts of individual pools for various asset classes
 - Add proposed use of futures along with proposed asset class changes to be approved by CIO as part of each rebalancing
 - For periods of time where futures are in use, cash flows sent to/from futures commission merchant for daily mark-to-market

Strategic use of futures

- In theory, if plan assets were far less liquid than currently, situations might arise where it becomes difficult to rebalance with low tracking error to plan benchmark
- A *strategic* use of futures could be helpful in such situations in order to rebalance closer to target than might be possible if only rebalancing among the liquid plan assets
- Futures could also be used to add leverage to plan assets if desired and approved
- Extensive analysis using current and proposed asset class targets suggests that strategic use of futures will be unlikely to be needed near-term
- May consider down the road should mix of plan assets become less liquid

Summary

- Employing a tactical use of futures within quarterly rebalancing process offers an additional tool for increasing efficiency and lowering plan tracking error
- Strategic use of futures may be considered at a later date but currently does not appear necessary given proposed asset allocation targets
- Adding an explicit Derivatives Guidelines will clarify and streamline ARMB authorizations

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Futures Guidelines	ACTION:	X
DATE:	June 17-18, 2021	INFORMATION:	

BACKGROUND:

In 2016, ARMB authorized staff to use futures as a portfolio tool. At that time, potential uses included:

- Cash equitization
- Portable alpha
- Transition management
- Portfolio rebalancing

Staff was authorized to engage in futures transactions that reference the S&P 500, Russell 1000, and Russell 2000 indices but limited to no more than \$750 million total notional value.

Staff successfully implemented both an internal cash equitization program and a portable alpha program. Both programs have since been discontinued for strategic reasons unrelated to the use of futures.

STATUS:

Staff believes that futures can be used to improve the efficiency of plan level portfolio management. For example, using futures to increase or decrease economic exposure to effect ARMB's asset allocation during quarterly rebalancing. Also, to conduct cash market executions in a more orderly fashion where size may impact liquidity.

While ARMB has already approved the use of futures in 2016, the authority was limited to the S&P 500, Russell 1000, and Russell 2000 with a total notional value of \$750 million. Additional authority is needed across other asset classes to effectively use this tool in a multi-asset portfolio rebalancing context. As a result, staff has developed new Futures Guidelines to memorialize this authority and establish constraints and risk controls.

RECOMMENDATION:

The ARMB approve Resolution 2021-03 which adopts the Futures Guidelines.

State of Alaska ALASKA RETIREMENT MANAGEMENT BOARD Relating to Futures Contracts

Resolution 2021-03

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee to the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policy for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, the Board contracts an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has established an asset allocation for the funds that considers earnings and liabilities on a current as well as a future basis; and

WHEREAS, the Board has authorized investments in futures contracts; and

WHEREAS, the Board/will establish and from time to time as necessary modify guidelines for futures contracts.

NOW THEREFORE BE IT RESOLVED THAT THE ALASKA RETIREMENT MANAGEMENT BOARD adopt the Futures Guidelines, attached hereto and made a part hereof.

DATED at Anchorage, Alaska this 18th day of June, 2021.

Chair

Dayle Harbe

ATTEST:

Secretary

FUTURES GUIDELINES

1. Program Objectives

The Futures Guidelines apply to plan level portfolio management initiatives undertaken by staff to manage ARMB's asset class exposures. The use of futures contracts is expected to be for replicating market exposures, efficient rebalancing of the asset allocation, and hedging purposes. These guidelines are not intended to enable or restrict the use of futures contracts at the strategy account level by external or internal managers. ARMB's asset class guidelines establish futures policy at the manager level.

2. Performance Objectives

There are no specific performance objectives for futures contracts. Futures contracts are expected to be used as tools to achieve broader asset allocation and performance objectives and will be evaluated within that context.

3. Program Structure

The account structure will allow for monitoring and risk control of the futures program. The structure will also enable performance to be captured within the relevant asset classes in which the exposure is taken.

ARMB staff will establish necessary agreements as required and depending on expected usage of such futures contracts.

4. Authorization

Staff is authorized to engage in both long and short positions in futures contracts.

5. Constraints

Futures contracts will be limited to the following notional exposure each on the following contracts (including e-mini):

- S&P 500 -- \$500 million
- Russell 2000 -- \$250 million
- U.S. Treasury Futures (all tenors) -- \$500 million
- MSCI EAFE -- \$500 million
- MSCI Emerging Markets -- \$250 million

Unless approved by ARMB, futures contracts will not be used to create financial leverage in the portfolio. Net long exposure may not be greater than 100%.

Short futures positions may only be established in assets where long cash positions of similar beta also exist. Gross exposure may not be greater than 180%.

6. Risk controls

Trading of these futures contracts and transfers of assets into and out of margin accounts required for trading and maintaining these futures contracts will only be authorized by the Chief Investment Officer or delegees who do not include individuals authorized to trade futures.

Standing limits with brokers will be set such that the amounts and types of trades will follow these Guidelines.

Individual futures contract open positions, trades, and mark-to-market will be monitored for compliance with these Guidelines by ARMB Compliance who will also oversee and establish trading system restrictions for futures contracts.

Arrowstreet Capital, L.P.

Relevant Mandates: International Equity

Hired: 2014

Firm Information	Investment Approach	Total ARMB Mandate
Arrowstreet Capital, L.P. is an independent private partnership that	Arrowstreet is a quantitative investment manager investing in international large cap securities on behalf of the ARMB.	Assets Under Management: 3/31/2021 \$683,060,597
serves as a discretionary institutional global asset manager. Arrowstreet is wholly-owned and controlled by members of their senior management team and non-executive directors.	Arrowstreet evaluates a broad set of investment signals (e.g., measures of valuation, momentum, catalysts, quality, and extreme sentiment) on both a direct and indirect basis across the globe. Specific signals are selected based on their intuitive investment appeal, historical ability to forecast future returns, statistical and economic significance, and ability to work well in a variety of market environments and across different universes of stocks. Furthermore,	
As of 3/31/2021, the firm's total assets under management were \$143,437 million.	quantitative tools enable Arrowstreet to leverage their insights over a broader universe of stocks more efficiently, provide a mechanism to trade off expected returns against risk and transaction costs, and provide an objective and disciplined process for making investment decisions.	
IZ E	Arrowstreet believes the key to generating alpha involves evaluating securities on an integrated	
Key Executives:	basis taking into consideration direct effects and indirect, or spillover, effects. The components of their model are based on the experiences and insights of their Investment Committee. This	
Peter Rathjens, Ph.D., Partner, CIO Anthony W. Ryan, CFA, Partner, President & CEO	integrated and dynamic model measures a stock's expected excess return by including the following influences:	
Manolis Liodakis, Ph.D., Partner, Head of Portfolio Management	 Direct effects - characteristics of the company itself; and Indirect effects - characteristics of other companies that are related. 	
John Campbell, Ph.D., Partner, Co- Head of Research		
Derek Vance, CFA, Partner, Co- Head of Research		
Alex Ogan, Partner, Portfolio Manager		
Jon Simon, CFA, Client Relationship Manager	Benchmark: MSCI ACWI Ex-US Index	

Concerns: None

3/31/2021 Performance									
	<u>Last Quarter</u>	<u>1-Year</u>	3-Years <u>Annualized</u>	5-Years <u>Annualized</u>	6-Years <u>Annualized</u>				
Arrowstreet	7.62%	68.68%	12.11%	14.27%	9.91%				
Arrowstreet (net)	7.51%	67.98%	11.61%	13.77%	9.41%				
MSCI ACWI Ex-US	3.49%	49.41%	6.51%	9.76%	6.35%				





Arrowstreet Attendees



Alex Ogan
Partner, Portfolio Management

Alex is a member of the Portfolio Management Group, focusing on portfolio construction considerations including the regular rebalancing of client portfolios and the ongoing monitoring of the efficacy of the firm's investment process. He also oversees various processes in the areas of client onboarding, transitions, and flow management. Alex joined Arrowstreet in 2005 as a member of the research group where he spent several years focusing on the development and enhancement of the firm's return and risk forecasting models, prior to transitioning to the portfolio management group in 2012. Alex received an AB in Economics with related studies in Computer Science from Harvard University in June 2005.



Jon Simon, CFAClient Relationship Manager

Jon is a member of the Client Relationship Management team responsible for Arrowstreet's client servicing efforts.

In this role, Jon serves as the primary point of contact for large asset owners that include state and local government entities, corporate pension plans, endowments and foundations. Prior to joining Arrowstreet, Jon was a Director on the Relationship Management team at Batterymarch Financial Management for a period of ten years. He also held earlier client-facing roles at Barclays Global Investors and MFS Investment Management. Jon has a BS and MS from Boston College; both degrees have a concentration in Finance. Jon is a CFA charterholder.



Table of Contents

Section 1 Firm Overview

Section 2 Performance, Attribution & Positioning

Exhibits **Supporting Materials**

The information set forth herein has been prepared by Arrowstreet Capital, Limited Partnership ("we," us," "our," or "Arrowstreet") solely for the benefit of Alaska Retirement Management Board for informational and discussion purposes only. All information contained herein is proprietary and confidential. Any reproduction or distribution of these materials, in whole or in part, or the disclosure of its contents, without Arrowstreet's prior written consent, is prohibited. Please see Additional Disclosures at the end of this presentation.

This information has been prepared for a one-on-one presentation and is not intended for mass distribution.

Firm Overview

Firm Overview



Specialist Global Equities Manager



Commitment to Ongoing Research Program



Senior Investment Team

Peter Rathjens, PhD - Partner, CIO Co-Founded ASC: 1999

Research

John Campbell, PhD

Partner.

Co-Head of Research

1999

Derek Vance, CFA

Partner. Co-Head of Research

Naveen Kartik C. K.

Partner

2013

Yosef Klein

Partner

2012

Jonathan Kluberg, PhD

Partner

2015

Tom Knox, PhD

Partner

Christopher Malloy, PhD

Partner

2019

Alex Merlis, CFA

Partner

2006

Tuomo Vuolteenaho, PhD

Partner

2004

Julia Yuan, CFA

Partner

2012

Yijie Zhang, PhD

Partner

2006

Investment Processes

Sam Thompson, PhD

Partner.

Head of Investment Processes 2005

Marta Campillo, PhD

Partner

1999

Hui Wang, PhD

Partner

2012

Investment Services

Katie McHardy

Partner.

Head of Investment Services

2010

Joe Tiano

Partner

2014

Investment Analytics

Mary Rogers, CFA

Partner.

Head of Investment Analytics

2008

Portfolio Management

Manolis Liodakis. PhD

Partner.

Head of Portfolio Management

2012

Brandon Berger

Partner

2013

John Capeci, PhD

Partner

1999

Anne Luisi

Manager

2014

Alex Ogan

Partner

George Pararas-Carayannis,

CFA

Partner

2002

Alex Rodin, CFA

Manager

2016

Zach Vernon, CFA

Partner

2008

Michael Zervas, CFA

Partner

2004

Average Industry Experience: 17 Years

Average Tenure with Arrowstreet: 12 Years

Supported by 84 Additional Investment Professionals

Note: Year denotes when team member started at Arrowstreet. Data as of March 31, 2021



Assets Under Management

— \$ 143,437 MM —



Data as of March 31, 2021. Figures presented above are in USD. Source: Arrowstreet Internal Databases.



Investment Strategies Overview

	Strategy	Strategy		Targets [†]				
Strategy Preferred Benchmark	Inception Date	AUM (\$mil)	Value Add	Tracking Error	Info Ratio			
	Global E	quity						
Long-Only								
ACW I MSCI ACWI IMI	Feb-06	\$41,975	3%	3-7%	0.55			
W orld MSCI World IMI	Aug-01	\$14,801	3%	3-7%	0.55			
W orld Futures Beta Management MSCI World IMI	Apr-14	\$536	3.5%	3.5-7.5%	0.58			
ACW I Minimum Volatility MSCI ACWI Min Vol	Nov-10	\$2,561	3%	3-7%	0.55			
W orld Low Active Risk MSCI World IMI	May-16	\$1,294	1%	1-3%	0.67			
Small Cap ACW I MSCI ACWI Small Cap	Feb-09	\$865	4%	3.5-7.5%	0.67			
Small Cap W orld MSCI World Small Cap	Apr-06	\$2,297	4%	3.5-7.5%	0.67			
Small Cap W orld FBM MSCI World Small Cap	May-18	\$442	4.5%	4-8%	0.69			
A	lpha Ext	ension						
ACW I Alpha Extension MSCI ACWI IMI	Jul-12	\$25,426	5.5-8%	4.5-11%	0.79-0.84			
ACW I Min Vol Alpha Extension MSCI ACWI Min Vol	Sep-19	\$177	5.5%	4.5-8.5%	0.79			
W orld Alpha Extension MSCI World IMI	May-08	\$2,893	5.5%	4.5-8.5%	0.79			
W orld Min Vol Alpha Extension MSCI World Min Vol	Nov-13	\$428	5.5%	4.5-8.5%	0.79			
Small Cap W orld Alpha Extension MSCI World Small Cap	Mar-17	\$1,086	7%	5-9%	0.93			
	Beta Ne	utral						
Beta Neutral FTSE 3-Month Treasury Bill	Jun-04	\$1,510	9%	7-11%	1.00			
ESG Beta Neutral FTSE 3-Month Treasury Bill	Jun-19	\$105	9%	7-11%	1.00			

	Strategy	Strategy	Targets [†]						
Strategy Preferred Benchmark	Inception Date	AUM (\$mil)	Value Add	Tracking Error	Info Ratio				
Non-US Equity									
L	.ong-On	ly							
ACWI ex US MSCI ACWI ex-US IMI	Jun-00	\$22,654	3%	3-7%	0.55				
EAFE MSCI EAFE IMI	Nov-99	\$13,201	3%	3-7%	0.55				
Apha Extension									
ACW I ex US Alpha Extension MSCI ACWI ex-US IMI	May-15	\$3,666	5-5.5%	4-8.5%	0.77-0.79				
EAFE Alpha Extension MSCI EAFE IMI	Sep-08	\$1,415	5.5%	4.5-8.5%	0.79				
· ·	JS Equit	у							
L	.ong-On	ly							
US Equity Russell 3000	Sep-17	\$627	2%	2.5-6.5%	0.40				
Alpi	ha Exten	sion							
US Equity Alpha Extension Russell 3000	Sep-18	\$349	3.5%	3.5-7.5%	0.58				
US Equity Small Cap Alpha Extension Russell 2000	Sep-18	\$290	3.5%	3.5-7.5%	0.58				
Emerging Markets Equity									

Long-Only

May-01

Apha Extension

\$3,668

4%

3-9%

0.67

Data as of March 31, 2021.

Please see the Strategy and Performance Endnotes at the end of this presentation for important disclosures to be read in conjunction with the performance results presented herein.

Emerging Markets Equity

MSCI Emerging Markets IMI

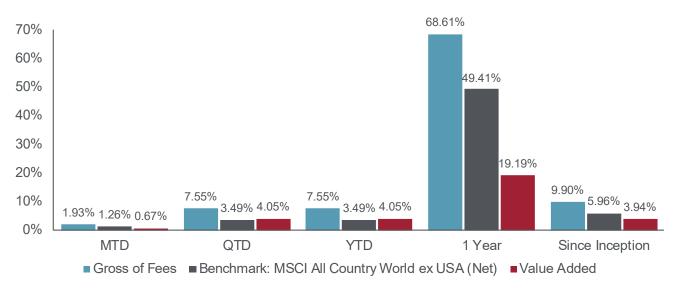
Emerging Markets Alpha Extension *MSCI Emerging Markets IMI*Feb-19

Figures presented above are in USD. Source: Arrowstreet Internal Databases.



Performance, Attribution & Positioning

Performance Since Inception March 31, 2021



	MTD	QTD	YTD	1 Year	Since Inception (December 1, 2014)
Account Performance (Gross of Fees)	1.93%	7.55%	7.55%	68.61%	9.90%
Benchmark: MSCI All Country World ex USA (Net)	1.26%	3.49%	3.49%	49.41%	5.96%
Value Added (Gross of Fees)	0.67%	4.05%	4.05%	19.19%	3.94%

Account Statistics	Since Inception (December 1, 2014)
Tracking Error*	3.33%
Information Ratio*	1.18

^{*}Tracking Error represents the annualized standard deviation of the difference between the portfolio return and the portfolio's benchmark return. Information Ratio is determined by dividing the portfolio's annualized value added by the portfolio's annualized tracking error.

Source: Arrowstreet Internal Databases. Return periods greater than 1 year are annualized.

This information has been prepared solely for the benefit of select, qualified institutional investors for educational, informational and discussion purposes only and is not intended for mass distribution. Gross of investment management fees performance presented above is based on the accounting, pricing and asset valuation methodologies of Arrowstreet's middle-office data provider. Gross of investment management fees performance is gross of base management fees and incentive allocations (if applicable). The return information presented represents past performance and is not a guarantee of future results. All returns are calculated in USD. Value added represents the difference between the portfolio's total returns and the benchmark. Source: MSCI. MSCI makes no express or implied warranties or representations and shall have no liability whatsoever with respect to any MSCI data contained herein. The MSCI data may not be further redistributed or used as a basis for other indices or any securities or financial products. This report is not approved, reviewed or produced by MSCI.



Basket Based Performance Attribution

Trailing 3 Months

	Total	COMMUNICATION SERVICES	CONSUMER DISCRETIONARY	CONSUMER STAPLES	ENERGY	FINANCIALS	HEALTH CARE	INDUSTRIALS	INFORMATION TECHNOLOGY	MATERIALS	REAL ESTATE	UTILITIES
Total	466	(4)	129	31	65	(34)	22	44	115	82	2	14
DEV AUSTRALIA	(4)	0	(0)	1	0	(9)	4	2	(8)	3	2	1
DEV AUSTRIA	3	0	0	0	3	(0)	0	0	0	(0)	0	0
DEV BELGIUM	3	(0)	0	2	0	(0)	1	(0)	0	(0)	(0)	0
DEV CANADA	40	(0)	8	1	(6)	(13)	(1)	1	39	10	0	1
DEV DENMARK	2	0	0	0	0	(0)	(1)	(0)	(0)	0	0	3
DEV FINLAND	3	(0)	(0)	(0)	3	(0)	0	0	0	0	(0)	(0)
DEV FRANCE	(7)	0	(4)	1	(4)	(8)	Ö	(2)	(1)	8	1	1
DEV FRANCE DEV GERMANY	28	ŏ	29	1	0	(1)	(1)	(5)	(3)	3	4	1
DEV HONG KONG	22	0	(1)	1	0	20	(0)	3	0	0	(1)	(0)
DEV IRELAND	(1)	ŏ	(0)	1	0	0	0	(1)	0	(1)	0	0
DEV ISRAEL		(0)	0	(0)	(0)	(1)	(1)		(1)	(0)	0	(0)
DEV ITALY	(2)		3	0	(0)		1	(0)	1	0		
		(0)				(5)		8			(0)	(1)
DEV JAPAN	68	(8)	30	(5)	10	(1)	(4)	9	20	13	(5)	8
DEV NETHERLANDS	43	(0)	1	2	1	7	1	5	25	0	0	0
DEV NEW ZEALAND	3	0	0	1	(0)	0	1	0	0	0	(0)	1
DEV NORWAY	(0)	1	(0)	0	(0)	(0)	0	(0)	1	(1)	(0)	(0)
DEV PORTUGAL	1	0	0	0	(0)	(0)	0	0	0	0	0	1
DEV SINGAPORE	3	2	(0)	3	(0)	(3)	0	(0)	0	0	0	0
DEV SPAIN	2	1	(0)	(0)	(1)	(2)	0	1	1	0	0	2
DEV SWEDEN	(4)	(0)	9	0	(0)	(4)	(0)	(10)	2	(0)	0	0
DEV SWITZERLAND	24	0	(1)	10	0	(2)	4	13	1	(2)	0	(0)
DEV UNITED KINGDOM	20	2	(2)	(1)	(3)	(4)	3	4	(1)	18	0	3
DEV UNITED STATES	1	0	0	0	0	0	1	0	0	0	0	0
EMK ARGENTINA	0	0	0	0	0	0	0	0	0	0	0	0
EMK BRAZIL	(0)	0	3	0	2	(9)	0	2	(1)	2	0	1
EMK CHILE	(2)	0	(0)	(0)	(0)	(1)	0	0	0	(0)	(0)	0
EMK CHINA	101	(1)	49	7	14	6	4	4	10	10	(1)	(1)
EMK COLOMBIA	1	0	0	0	0	1	0	ō	0	0	0	0
EMK CZECH REPUBLIC	(0)	ŏ	0	0	ő	(0)	ő	ő	0	0	Ö	(0)
EMK EGYPT	0	ŏ	0	0	0	0	0	0	0	0	0	0
EMK GREECE	4	ŏ	(0)	0	0	(1)	0	5	0	0	0	(0)
EMK HUNGARY	0	ö	0	0	0	0	(0)	0	0	0	0	0
		1										
EMK INDIA	3 4		0	1	2	3	2	(1)	(1)	(3)	(0)	(0)
EMK INDONESIA	-	0	1	0	0	2	0	0	0	1	0	0
EMK KOREA	34	3	6	3	(0)	6	5	9	0	2	0	0
EMK KUWAIT	0	0	0	0	0	0	0	(0)	0	0	(0)	0
EMK MALAYSIA	2	0	(0)	1	0	1	0	0	0	(0)	0	0
EMK MEXICO	1	1	0	0	0	0	0	1	0	(1)	(0)	0
EMK PAKISTAN	0	0	0	0	0	0	0	0	0	0	0	0
EMK PERU	1	0	0	0	0	1	0	0	0	(0)	0	0
EMK PHILIPPINES	4	0	0	0	0	0	0	1	0	0	1	0
EMK POLAND	2	0	1	0	0	(0)	0	0	0	0	0	0
EMK QATAR	1	0	0	0	0	1	0	(0)	0	0	0	0
EMK RUSSIA	12	(2)	0	(2)	19	3	0	(1)	(0)	2	(0)	(8)
EMK SAUDI ARABIA	(1)	(2)	0	1	2	(5)	(2)	1	0	3	(0)	(0)
EMK SOUTH AFRICA	4	(1)	(4)	0	(0)	1	(0)	(0)	0	7	0	0
EMK TAIWAN	35	1	2	0	0	(1)	3	1	30	(0)	(0)	ō
EMK THAILAND	1	0	(1)	(1)	1	(1)	(0)	(0)	1	3	(0)	(0)
EMK TURKEY	(16)	(2)	0	(0)	ō	(15)	0	(4)	0	5	0	0
EMK UAE	(1)	(1)	0	0	0	(0)	0	(0)	0	0	(0)	0
LIVIK UAL	(1)	(1)	U	U	U	(0)		(0)	. 0	U	(0)	

Legend	
Added Value (Active weight > 15 bps)	Х
Lost Value (Active weight > 15 bps)	(X)
Added Value (Active weight < -15 bps)	Х
Lost Value (Active weight < -15 bps)	(X)

Summary Attribution Results:			
	Developed(%)	Emerging(%)	Total(%)
Allocation	0.94	0.90	1.85
Selection	1.80	1.01	2.81
Total Equity Effect	2.75	1.91	4.66
Currency Allocation Effect	-0.32	-0.45	-0.77
Currency Selection Effect	0.00	0.00	0.00
Currency Effect	-0.32	-0.45	-0.77
Futures Cash Effect			
Cash Effect			-0.08
Total Cash Effect			-0.08
Compounding Effect			0.14
Trade Cost & Unexplained Effects			0.11
Value Added (%)			4.05

Data as of March 31, 2021.

Source: Arrowstreet Internal Databases.

Note: Basket grid shows value added contributions in basis points. The portfolio performance attribution assesses performance from a country, sector, basket, and stock perspective. The information above is presented gross of management fees. If fees had been deducted, performance would be lower. Arrowstreet's Internal Portfolio Attribution System was used to prepare this data and/or report (at your request). Please note that this data is based on the data provided by Arrowstreet's Middle-office service provider which maintains the Middle-office records for Arrowstreet for its internal trading purposes. Arrowstreet is not the official recordkeeper for the account and therefore the attached information is not intended to be relied upon to support accounting records, financial statements or regulatory filings for the account. No representation or warranty is being made with respect to such data. Please note this information is provided at your request and is for informational purposes only.



Basket Based Performance Attribution Trailing 12 Months

		COMMUNICATION	CONSUMER						INFORMATION				
	Total	SERVICES	DISCRETIONARY	CONSUMER STAPLES	ENERGY	FINANCIALS	HEALTH CARE	INDUSTRIALS	TECHNOLOGY	MATERIALS	REAL ESTATE	UTILITIES	
otal	1,381	53	205	160	93	89	(8)	62	295	387	39	5	
EV AUSTRALIA	101	3	7	2	5	(3)	21	2	14	44	1	3	
EV AUSTRIA	2	0	0	0	3	(1)	0	(0)	0	(0)	0	(0)	
EV BELGIUM	1	1	(0)	3	0	0	(3)	(0)	0	(0)	(0)	0	
EV CANADA	154	5	39	9	17	(4)	1	(1)	47	31	3	8	
EV DENMARK	(16)	0	0	1	0	(0)	(2)	(15)	(0)	1	0	(1)	
EV FINLAND	(1)	2	0	(0)	(1)	(0)	1	(1)	0	(0)	(0)	(1)	
EV FRANCE	88	5	4	11	8	(11)	(3)	(0)	6	66	1	1	
EV GERMANY	68	10	40	3	0	1	1	(26)	19	14	4	3	
EV HONG KONG	44	1	(1)	1	0	17	(1)	15	(0)	0	6	6	
EV IRELAND	(3)	0	(4)	3	0	0	(0)	(0)	0	(3)	0	0	
EV ISRAEL	(11)	(0)	0	(0)	0	2	(0)	1	(13)	(0)	0	(0)	
EV ITALY	64	(0)	34	(0)	14	(7)	2	21	1	0	(0)	(1)	
EV JAPAN	22	(4)	21	0	(2)	(13)	(11)	(13)	39	25	6	(26)	
EV NETHERLANDS	75	0	0	(1)	1	32	(4)	12	32	3	0	0	
EV NEW ZEALAND	8	1	0	3	(0)	0	2	(0)	3	0	(0)	(0)	
EV NORWAY	13	2	(0)	2	4	(1)	0	(0)	7	(1)	(0)	(0)	
EV PORTUGAL	3	(0)	0	0	1	(0)	0	0	0	0	0	2	
EV SINGAPORE	32	26	0	3	(0)	(1)	0	2	(0)	0	2	0	
EV SPAIN	15	4	2	(0)	1	(0)	2	4	(1)	(1)	0	3	
EV SWEDEN	(2)	4	8	2	(0)	(3)	(0)	(10)	(1)	(2)	0	0	
EV SWITZERLAND	7	2	(3)	48	O	(3)	(43)	9	2	(6)	1	(0)	
EV UNITED KINGDOM	169	12	(7)	15	20	38	15	5	(1)	59	1	11	
EV UNITED STATES	9	0	0	0	(0)	0	2	0	8	0	0	0	
MK ARGENTINA	(2)	0	0	0	(1)	(0)	0	0	(1)	0	0	0	
MK BRAZIL	95	(1)	3	0	8	(8)	(0)	26	18	48	(1)	2	
MK CHILE	4	(0)	(0)	0	(0)	2	0	0	0	2	0	0	
MK CHINA	110	(43)	26	21	19	31	18	4	(19)	38	12	1	
MK COLOMBIA	1	0	0	0	(0)	1	0	0	0	0	0	(0)	
MK CZECH REPUBLIC	(0)	ő	0	0	0	(0)	0	0	0	0	0	0	
MK EGYPT	1	Ö	0	0	0	1	0	0	0	0	0	0	
MK GREECE	14	ő	1	0	1	4	0	8	0	0	0	1	
MK HUNGARY	0	ő	0	0	ō	0	(0)	0	0	0	0	ō	
MK INDIA	(45)	Ö	(7)	5	(6)	(10)	(1)	(3)	(15)	(9)	(0)	ō	
MK INDONESIA	5	1	0	2	0	2	0	0	0	(0)	0	(0)	
MK KOREA	144		30	9	(2)	9	8	25	56	(0)	0	0	
MK KUWAIT	0	ō	0	0	0	0	ő	(0)	0	0	(0)	Ö	
MK MALAYSIA		1		2	1	2	(12)	1	0	(1)	0	2	
MK MEXICO	(5) 4	4	(0)	4	0	(1)	0	(0)	0	(3)	0	0	
MK PAKISTAN	0	0	0	0	0	0	0	0	0	(3)	0	0	
MK PAKISTAN MK PERU	13	0	0	0	0	1	0	0	0	12	0	0	
MK PHILIPPINES	4	0		0	0	1	0	1	0	0	1	0	
MK POLAND	1	0	(0)		0	1	0	0	0	_	0		
				(0)		_	_			(1)		(0)	
MK QATAR	19	0	0	0	0	4	0	(1)	0	0	0	0	
MK RUSSIA		16	0	3	(3)	18	0	(6)	(7)	11 4	0	(14)	
MK SAUDI ARABIA	1	(2)	1	1	3	(4)	(3)	2	0	-	0	(0)	
MK SOUTH AFRICA	12	(1)	2	2	(0)	(1)	0	(0)	0	10	0	0	
MK TAIWAN	128	3	5	2	0	4	4	1	103	4	(0)	0	
MK THAILAND	12	2	(1)	2	(0)	(0)	1	1	(0)	7	0	(0)	
MK TURKEY	19	(3)	3	0	(1)	(8)	0	(0)	0	25	0	2	
MK UAE	(2)	(1)	0	0	0	(0)	0	0	0	0	(1)	0	
MK KAZAKHSTAN	(0)	0	0	0	0	(0)	0	0	0	0	0	0	

Legend	
Added Value (Active weight > 15 bps)	Х
Lost Value (Active weight > 15 bps)	(X)
Added Value (Active weight < -15 bps)	X
Lost Value (Active weight < -15 bps)	(X)

	Developed(%)	Emerging(%)	Total(%)
Allocation	4.34	3.12	7.46
Selection	4.09	2.26	6.35
Total Equity Effect	8.43	5.38	13.81
Currency Allocation Effect	-1.30	-0.39	-1.69
Currency Selection Effect	0.00	-0.00	-0.00
Currency Effect	-1.30	-0.39	-1.69
Futures Cash Effect			
Cash Effect			-0.39
Total Cash Effect			-0.39
Compounding Effect			6.66
Trade Cost & Unexplained Effects			0.80
Value Added (%)			19.19

Data as of March 31, 2021.

Source: Arrowstreet Internal Databases.

Note: Basket grid shows value added contributions in basis points. The portfolio performance attribution assesses performance from a country, sector, basket, and stock perspective. The information above is presented gross of management fees. If fees had been deducted, performance would be lower. Arrowstreet's Internal Portfolio Attribution System was used to prepare this data and/or report (at your request). Please note that this data is based on the data provided by Arrowstreet's Middle-office service provider which maintains the Middle-office records for Arrowstreet for its internal trading purposes. Arrowstreet is not the official recordkeeper for the account and therefore the attached information is not intended to be relied upon to support accounting records, financial statements or regulatory filings for the account. No representation or warranty is being made with respect to such data. Please note this information is provided at your request and is for informational purposes only.



Summary Attribution Results Trailing 3 Months

Summary Attribution Results: Alaska								
	Developed	Emerging & Frontier	Total					
Equity Allocation	0.94	0.90	1.85					
Equity Selection	1.80	1.01	2.81					
Total Equity Effect	2.75	1.91	4.66					
Currency Allocation	-0.32	-0.45	-0.77					
Currency Selection	0.00	0.00	0.00					
Total Currency Effect	-0.32	-0.45	-0.77					
Futures Cash			0.00					
Cash			-0.08					
Total Cash Effect			-0.08					
Compounding Effect			0.14					
Trade Cost & Unexplained Effects			0.11					
Value Added (%)			4.05					

Data as of March 31, 2021.

Source: Arrowstreet Internal Databases.

Note: The performance information above is presented gross of management fees. If fees had been deducted, performance would be lower. Please see important disclosure information at the end of this presentation.

VÁ Inv. Activity (Ex. Beta Mgmt.): Represents the value added (VA) from all investment decisions excluding investment decisions relating to beta management.

VA Beta (Beta Mgmt.): Represents the VA from investment decisions related to beta management, including both tactical active market beta tilts and tilts within the portfolio motivated by beta arbitrage considerations.

Beta Management Effect: Represents the sum of the VA from investment decisions relating to beta management.



Summary Attribution Results Trailing 12 Months

Summary Attribution Results: Alaska								
	Developed	Emerging & Frontier	Total					
Equity Allocation	4.34	3.12	7.46					
Equity Selection	4.09	2.26	6.35					
Total Equity Effect	8.43	5.38	13.81					
Currency Allocation	-1.30	-0.39	-1.69					
Currency Selection	0.00	0.00	0.00					
Total Currency Effect	-1.30	-0.39	-1.69					
Futures Cash			0.00					
Cash			-0.39					
Total Cash Effect			-0.39					
Compounding Effect			6.66					
Trade Cost & Unexplained Effects			0.80					
Value Added (%)			19.19					

Data as of March 31, 2021.

Source: Arrowstreet Internal Databases.

Note: The performance information above is presented gross of management fees. If fees had been deducted, performance would be lower. Please see important disclosure information at the end of this presentation.

VÁ Inv. Activity (Ex. Beta Mgmt.): Represents the value added (VA) from all investment decisions excluding investment decisions relating to beta management.

VA Beta (Beta Mgmt.): Represents the VA from investment decisions related to beta management, including both tactical active market beta tilts and tilts within the portfolio motivated by beta arbitrage considerations.

Beta Management Effect: Represents the sum of the VA from investment decisions relating to beta management.



Active (Benchmark Relative) Portfolio Weights

Country	Total	Comm. Services	Consumer Disc.	Consumer Staples	Energy	Financials	Health Care	Industrials	Info Tech	Materials	Real Estate	Utilitie
Total		-2.76	0.94	-5.25	4.83	-9.33	-3.53	0.86	9.01	8.28	-2.51	-1.8
Developed Markets	-1.31	0.24	4.88	-4.56	2.04	-7.91	-2.46	-0.43	7.40	3.24	-1.84	-1.9
Australia	-1.95	-0.10	-0.20	-0.25	-0.18	-1.49	-0.47	-0.21	0.45	0.86	-0.29	-0.0
Austria	0.24	0.00		0.00	0.31	-0.05		0.00	0.00	0.00	0.00	-0.0
Belgium	-0.28	-0.01	0.03	-0.20	0.00	0.09	-0.11	0.00	0.00	-0.07	0.00	-0.0
Canada	-3.22	-0.19	0.68	-0.26	-0.85	-1.94	-0.07	-0.75	0.04	0.36	0.05	-0.2
Denmark	-1.11		0.00	-0.06	0.00	-0.08	-0.48	-0.28	0.00	-0.09		-0.1
Finland	-0.16	-0.03	0.02	-0.03	-0.09	-0.08	-0.02	0.03	0.20	-0.11	0.00	-0.0
France	-5.40	-0.31	-1.08	-0.74	-0.45	-0.70	0.11	-1.37	-0.17	-0.38	-0.10	-0.2
Germany	1.38	0.05	2.57	-0.08	0.00	-0.60	-0.64	-0.28	0.80	0.03	-0.26	-0.2
Hong Kong	-1.14	-0.03	0.22	-0.05		-0.94	0.00	0.22	0.01		-0.39	-0.1
Ireland	-0.44		-0.13	-0.08		0.00	0.00	-0.05		-0.18	0.00	
Israel	0.02	0.00	0.00	0.00	0.00	-0.10	-0.05	-0.01	0.21	-0.02	-0.01	0.0
Italy	1.91	-0.04	0.88	-0.02	1.51	-0.34	-0.05	0.40	-0.03	0.00	0.00	-0.3
Japan	9.24	0.74	2.37	-0.11	0.44	-0.06	-0.02	1.71	2.99	1.41	-0.55	0.3
Netherlands	4.36	-0.05	-0.25	-0.31	0.19	0.71	0.61	1.13	2.52	-0.19	0.00	
New Zealand	-0.16	-0.02	0.00	-0.02	0.00		-0.07	-0.03	0.00	0.00	0.00	-0.0
Norway	-0.10	-0.09	0.00	-0.07	0.06	-0.09		0.00	0.12	-0.03	0.00	0.0
Portugal	-0.10	0.00		-0.02	-0.02	0.00		0.00		0.00		-0.0
Singapore	-0.23	0.23	-0.02	0.14	0.00	-0.37	0.00	-0.06	-0.02		-0.14	0.0
Spain	-1.24	-0.16	-0.14	0.00	-0.07	-0.23	-0.03	-0.09	-0.12	0.00	0.00	-0.4
Sweden	0.08	0.39	0.32	-0.14	-0.02	0.26	0.00	-0.70	0.06	-0.08	-0.02	
Switzerland	-1.42	-0.05	0.13	-0.77	0.02	-0.59	-0.55	0.50	0.12	-0.17	-0.03	0.0
United Kingdom	-1.58	-0.09	-0.51	-1.50	1.20	-1.31	-0.62	-0.59	0.22	1.94	-0.11	-0.3
United States	2.50	0.00	-0.54	-2130	1.20	- 4104	-0.02	-0.33	0.22	4.54	0.11	-0
Emerging Markets	0.04	-3.00	-3.94	-0.69	2.80	-1.41	-1.07	1.29	1.62	5.03	-0.66	0.0
Argentina	-0.03	0.00	-5.5-1	5.55	0.00		-2.07	2.25	-0.03	3.03	0.00	-
Brazil	0.77	-0.02	-0.11	-0.12	0.21	0.17	-0.05	0.31	0.06	0.36		-0.0
Chile	-0.18	0.02	-0.01	-0.02	-0.02	-0.05	0.03	0.52	0.00	-0.04	0.00	-0.0
China	-6.88	-2.39	-3.80	-0.51	1.49	-1.14	-0.78	0.46	-0.66	1.10	-0.47	-0.1
Colombia	-0.05	-2.33	-3.00	-0.31	-0.01	-0.03	-0.70	0.40	-0.00	1.10	-0.47	-0.0
Czech Republic	-0.03				-0.01	-0.02						-0.0
Egypt	-0.02			0.00		-0.02		0.00				-0.1
Greece	0.27	-0.01	0.05	0.00		0.08		0.13				0.0
Hungary	-0.06	-0.01	0.03		-0.01	-0.04	-0.02	0.13				0.0
India	-2.98	-0.10	-0.25	-0.29	-0.36	-0.78	-0.16	-0.11	-0.52	-0.30	-0.01	-0.0
Indonesia	-0.37	-0.05	-0.03	-0.04	-0.01	-0.19	-0.01	-0.11	-0.32	-0.03	0.01	0.0
Korea	4.04	-0.37	0.56	0.11	-0.06	0.43	-0.24	0.13	2.72	0.79		-0.0
Kuwait	-0.16	-0.02	0.30	0.11	-0.00	-0.12	-0.24	-0.01	2.72	0.75	-0.01	-0.1
Malaysia	-0.16	-0.02	-0.02	-0.06	-0.02	-0.12	-0.01	0.01		-0.03	-0.01	-0.0
Mexico	-0.46	-0.12	-0.02	-0.17	-0.02	-0.06	-0.01	-0.04		-0.04	-0.01	-0.0
Pakistan	-0.01	-0.12		-0.27	0.00	0.00		-0.04		-0.04	-0.01	-0.1
Peru	0.45				0.00	-0.04				0.48		
Philippines	-0.20	-0.01	-0.01	-0.01		-0.04		-0.07		0.40	-0.05	-0.0
Poland	-0.11	-0.02	-0.03	-0.01	0.03	-0.07		-0.07		0.00	-0.03	-0.0
Qatar	-0.11	-0.02	-0.03	-0.01	-0.02	-0.07		-0.02		-0.01	-0.01	-0.0
Russia	5.71	0.16		0.26	1.66	1.78		-0.02		1.27	-0.01	0.9
Saudi Arabia	1.01	0.16	-0.01	0.26	0.03	-0.38	0.24	0.08		0.64	-0.01	-0.0
South Africa	-0.58	-0.07	-0.01	-0.08	-0.01	-0.38	-0.01	-0.01		0.64		-0.0
Taiwan			0.18	-0.08	-0.01		0.01		0.06	-0.06	-0.02 -0.01	
Taiwan Thailand	-0.36 -0.29	-0.07	-0.05	-0.07	-0.01	-0.49 0.07	-0.04	0.11 -0.05	-0.01	-0.06	-0.01	-0.0
		-0.05					-0.04		-0.01		-0.02	-0.0
Turkey	1.28	0.10	0.03	0.11	-0.01	0.13		0.36		0.55		
UAE	-0.15	-0.04				-0.11		0.03			-0.03	

Legend	Color Code
> 0.15	
< -0.15	

Active Cash Position	1.28
Futures Cash	

Data as of March 31, 2021.

Source: Arrowstreet Internal Databases.
*Portf olio weights are measured at the end of the calendar period indicated. Weights may temporarily drift beyond position limits in between trading sessions because of price movements.



Active (Benchmark Relative) Portfolio Weight Shifts

Country	Total	Comm. Services	Consumer Disc.	Consumer Staples	Energy	Financials	Health Care	Industrials	Info Tech	Materials	Real Estate	Utilities
Total		0.32	4.02	-0.56	2.78	-0.02	-1.39	2.42	-0.49	-5.66	0.04	-1.89
Developed Markets	5.18	0.79	4.21	-0.37	1.71	0.36	-0.80	2.15	1.79	-3.04	0.08	-1.70
Australia	-1.46	0.00	0.02	0.01	-0.03	-0.12	0.04	0.02	0.33	-1.75	0.01	0.01
Austria	0.35	0.00		0.00	0.33	0.00		0.00	0.00	0.02	0.00	0.00
Belgium	0.30	0.00	0.00	0.03	0.00	0.26	0.01	0.00	0.00	0.00	0.00	0.00
Canada	-1.79	-0.01	0.02	0.00	-0.10	0.03	-0.06	-0.04	-1.02	-0.69	0.09	0.00
Denmark	-0.40		0.00	0.00	0.00	-0.02	-0.52	0.10	0.00	0.00		0.04
Finland	0.13	0.00	0.02	0.00	0.03	0.00	0.00	0.09	-0.01	0.01	0.00	0.00
France	-1.68	0.00	0.06	0.01	-0.02	-0.07	-0.03	0.00	-0.50	-1.10	0.01	-0.05
Germany	2.37	0.36	1.19	0.08	0.00	0.14	0.00	0.06	0.28	0.22	0.04	0.01
Hong Kong	-0.22	0.00	-0.02	-0.16		-0.09	0.00	0.10	0.00		-0.05	-0.01
Ireland	-0.01		0.00	0.01		0.00	0.00	-0.01		-0.01	0.00	
Israel	-0.10	0.00	0.00	0.00	0.00	-0.01	-0.01	0.00	-0.08	0.00	0.00	0.00
Italy	0.83	0.00	0.32	0.00	1.08	0.08	0.01	-0.06	0.01	0.00	0.00	-0.61
Japan	4.36	0.43	2.11	0.11	0.08	-0.45	-0.17	1.11	1.34	0.22	-0.03	-0.39
Netherlands	3.16	-0.01	0.01	0.02	0.21	0.19	0.49	0.88	1.36	0.00	0.00	
New Zealand	0.03	0.00	0.00	0.01	0.00		0.01	0.00	0.00	0.00	0.00	0.01
Norway	-0.08	0.00	0.00	0.00	-0.08	0.00		0.00	0.00	-0.01	0.00	0.00
Portugal	0.01	0.00		0.00	0.00	0.00		0.00		0.00	-	0.01
Singapore	-0.12	-0.11	0.00	0.03	0.00	-0.03	0.00	0.00	0.00		0.00	0.00
Spain	-1.23	-0.19	0.00	0.00	-0.27	0.00	-0.04	0.01	0.01	0.00	0.00	-0.74
Sweden	1.51	0.46	0.39	0.01	0.00	0.60	0.00	0.05	0.00	0.00	0.00	,
Switzerland	0.76	0.00	0.30	0.67	0.00	-0.02	-0.20	-0.05	0.08	-0.02	0.00	0.00
United Kingdom	-1.47	-0.13	-0.21	-1.20	0.48	-0.11	-0.27	-0.11	-0.01	0.08	0.00	0.02
United States	-0.06	-0.13	-0.21	-1.20	0.40	-0.11	-0.06	-0.11	-0.01	0.00	0.00	0.02
Emerging Markets	-5.61	-0.47	-0.20	-0.18	1.07	-0.37	-0.59	0.27	-2.27	-2.62	-0.04	-0.19
Argentina	0.00	0.00	-0.20	-0.20	0.00	-0.57	-0.55	0.27	0.00	-2.02	0.04	-0.23
Brazil	-1.63	-0.04	-0.06	0.04	-0.16	-0.50	0.01	-0.03	-0.05	-0.85	0.01	0.01
Chile	-0.02	-0.04	0.00	0.00	0.00	-0.01	0.01	-0.03	-0.03	-0.01	0.00	0.00
China	1.70	-0.08	0.33	0.04	1.31	0.36	-0.02	0.51	0.16	-0.89	-0.03	0.00
Colombia	0.01	-0.08	0.33	0.04	0.00	0.01	-0.02	0.51	0.16	-0.89	-0.03	0.00
Czech Republic	0.00				0.00	0.00						0.00
	0.00			0.00		0.00		0.00				0.00
Egypt	0.02	0.00	0.03	0.00	-0.02	-0.01		0.00				0.00
Greece Hungary	0.02	0.00	0.03		0.02	0.00	0.00	0.02				0.00
India	-0.10	-0.03	-0.01	0.01	0.00	0.00	0.00	-0.01	-0.03	-0.04	0.00	0.00
Indonesia	0.04	0.00	0.01	0.00	0.00	0.00	0.01	-0.01	-0.03	0.00	0.00	0.00
								0.22	0.14			
Korea	-1.56	-0.34	-0.39	-0.17	0.00	0.23	-0.14	-0.32	-0.14	-0.28	0.00	0.01
Kuwait	0.00	0.00	0.00	0.04	0.00	0.00				0.00	0.00	0.04
Malaysia	-0.04	0.00	0.00	0.01	0.00	0.01	-0.10	0.04		0.00		0.00
Mexico	0.03	0.01		0.00	0.00	0.00		0.01		0.01	0.00	0.00
Pakistan	0.00				0.00	0.00				0.04		
Peru	-0.01					0.01				-0.01		
Philippines	0.03	0.00	0.00	0.00		0.00		0.01			0.01	0.00
Poland	0.05	-0.01	0.00	0.00	0.06	0.00				0.00		0.00
Qatar	0.01	0.00			0.00	0.00		0.00		0.00	0.00	0.00
Russia	-0.78	-0.03		-0.04	-0.20	-0.08		-0.17	-0.11	-0.03	-0.02	-0.10
Saudi Arabia	0.18	80.0	0.00	0.08	0.12	-0.06	-0.03	-0.06		0.09	0.00	-0.04
South Africa	-0.66	-0.01	-0.05	0.00	0.00	-0.03	0.00	0.00		-0.57	0.00	
Taiwan	-2.26	0.00	0.01	0.00	0.00	-0.02	-0.32	0.14	-2.11	0.04	0.00	
Thailand	-0.14	0.00	-0.07	-0.01	-0.06	0.11	0.00	0.00	0.01	-0.06	0.00	-0.07
Turkey	-0.52	-0.03	0.00	-0.15	0.00	-0.42		0.10		-0.02		
UAE	0.01	-0.01				-0.01		0.03			0.00	

Color Code > 0.15 < -0.15

Active Cash Shift 0.44 **Futures Cash**

Data as of March 31, 2021.

Source: Arrowstreet Internal Databases.
*Portf olio weights are measured at the end of the calendar period indicated. Weights may temporarily drift beyond position limits in between trading sessions because of price movements.



Currency Positions

Currency	Portfolio Weight*	Benchmark Weight	Active Weight*	Active Weigh Shifts
Developed Markets	68.06	68.91	-0.85	5.14
Australian Dollar	3.44	4.95	-1.51	-1.81
British Pound	5.22	7.55	-2.33	-0.20
Canadian Dollar	3.51	6.72	-3.21	-1.79
Danish Krone	0.40	1.49	-1.08	-0.40
Euro	20.55	21.01	-0.46	2.63
Hong Kong Dollar	0.96	2.07	-1.10	-0.22
Israeli New Shekel	0.39	0.37	0.02	-0.10
Japanese Yen	24.99	15.49	9.50	4.59
New Zealand Dollar	0.00	0.16	-0.16	0.0
Norwegian Kroner	0.16	0.39	-0.24	-0.0
Singapore Dollar	0.51	0.69	-0.18	-0.1
Swedish Krona	2.33	2.25	0.08	1.5
Swiss Franc	4.41	5.73	-1.32	0.8
US Dollar	1.17	0.03	1.14	0.1
Emerging Markets	31.94	31.09	0.85	-5.1
Argentine Peso	0.52	0.03	0.50	0.2
Brazilian Real	2.15	1.38	0.78	-1.6
Chilean Peso	0.00	0.22	-0.22	-0.0
Chinese Yuan Renminbi	4.81	11.73	-6.92	1.7
Chinese Yuan Renminbi - Offshore	0.00	0.00	0.00	0.0
Colombian Peso	0.00	0.05	-0.05	0.0
Czech Koruna	0.00	0.03	-0.03	0.0
Egyptian Pound	0.00	0.02	-0.02	0.0
Hungarian Forint	0.00	0.06	-0.02	0.0
Indian Rupee	0.00	2.98	-2.98	-0.1
Indonesian Rupiah	0.00	0.38	-0.37	0.0
Korean Won	8.27	4.11	4.16	-1.5
Kuwaiti Dinar	0.00	0.16	-0.16	0.0
	0.04	0.42	-0.18	-0.0
Malaysian Ringgit Mexican Peso	0.04	0.42	-0.38	-0.0
		0.55	-0.47	
Pakistan Rupee Peruvian Nuevo Sol	0.00	0.01	-0.01	0.0 -0.0
	0.00	0.07	-0.20	-0.0
Philippine Peso		0.20	-0.20	
Polish Zloty	80.0			0.0
Qatari Rial	0.00	0.21	-0.21	0.0
Russian Rouble	6.68	0.98	5.70	-0.6
Saudi Riyal	1.88	0.85	1.02	0.1
South African Rand	1.25	1.36	-0.11	-0.6
Taiwan Dollar	3.91	4.27	-0.36	-2.2
Thai Baht	0.29	0.58	-0.29	-0.1
Turkish Lira, New	1.43	0.09	1.34	-0.4
United Arab Emirates Dirham	0.03	0.18	-0.15	0.0
Frontier Markets	0.00	0.00	0.00	0.0
Kazakhstan Tenge	0.00	0.00	0.00	0.0

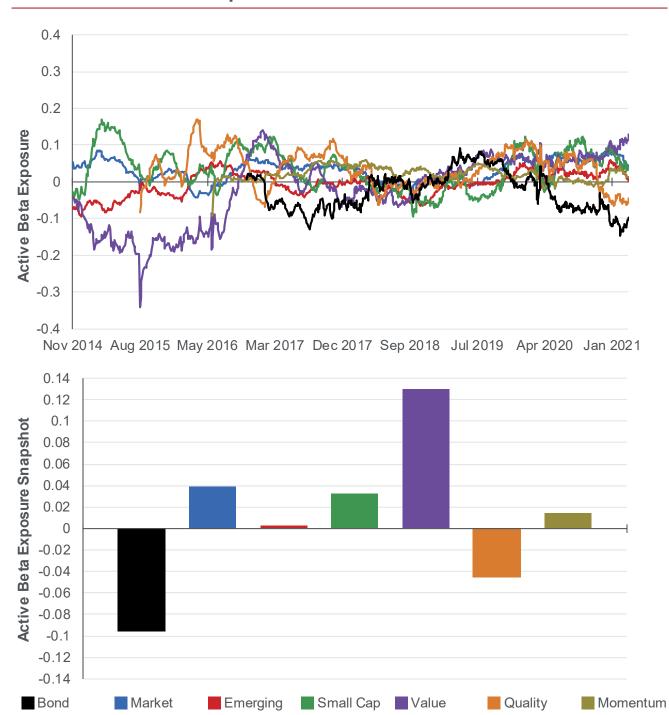
Legend	Color Code
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< -1.00	

Data as of March 31, 2021.

Source: Arrowstreet Internal Databases.
*Portf olio weights are measured at the end of the calendar period indicated. Weights may temporarily drift beyond position limits in between trading sessions because of pricing movements. The currency exposure of individual securities is based on Arrowstreet's research classification which can vary from the currency classification used by the benchmark provider.



Active Beta Exposure

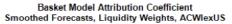


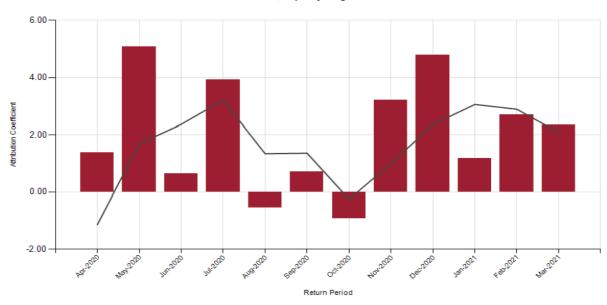
Data as of March 31, 2021.

Represents Arrowstreet's proprietary measures of ex ante style betas. Source: Arrowstreet Internal Databases.



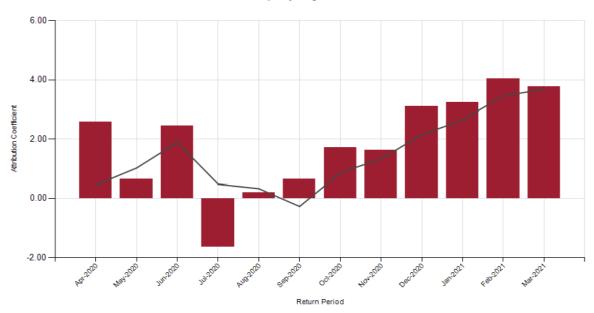
Model Attribution





- 3-month Avg

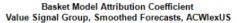
Stock Model Attribution Coefficient Smoothed Forecasts, Liquidity Weights, ACWlexUS Standard

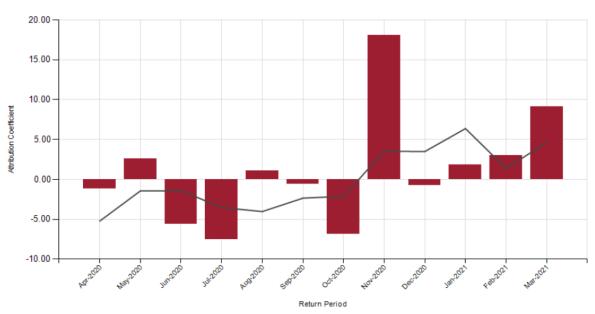


--- 3-month Avg



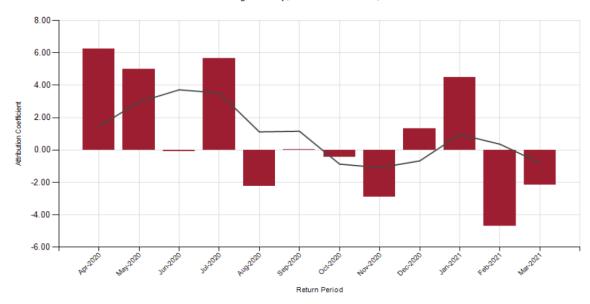
Basket Model Attribution Detail





- 3-month Avg

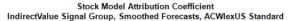
Basket Model Attribution Coefficient PriceMomentum Signal Group, Smoothed Forecasts, ACWlexUS

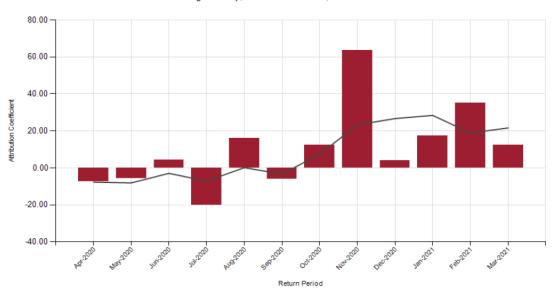


- 3-month Avg



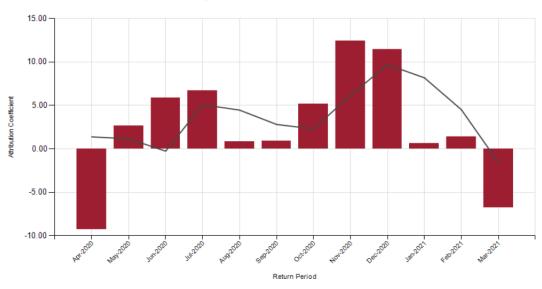
Stock Model Attribution Detail





- 3-month Avg

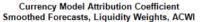
Stock Model Attribution Coefficient IndirectMomentum Signal Group, Smoothed Forecasts, ACWlexUS Standard

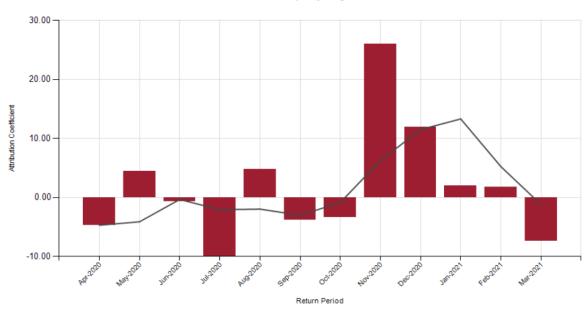


- 3-month Avg



Currency Model Attribution Detail





- 3-month Avg



Supporting Materials

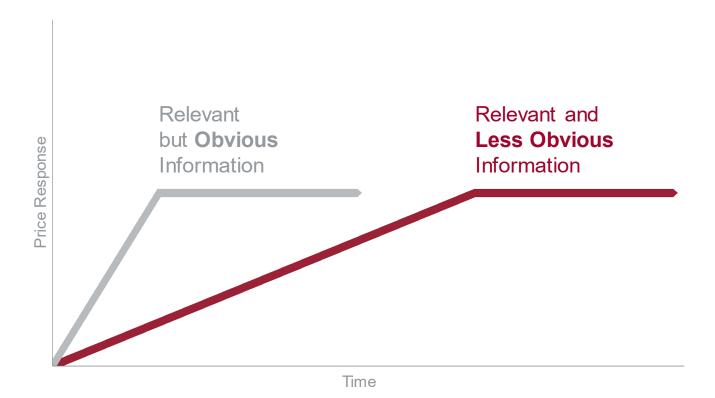
Investment Philosophy

Adding Value by Identifying Investment Signals that are

Relevant o to Price



& Less Obvious to Investors





Defining Direct Effects

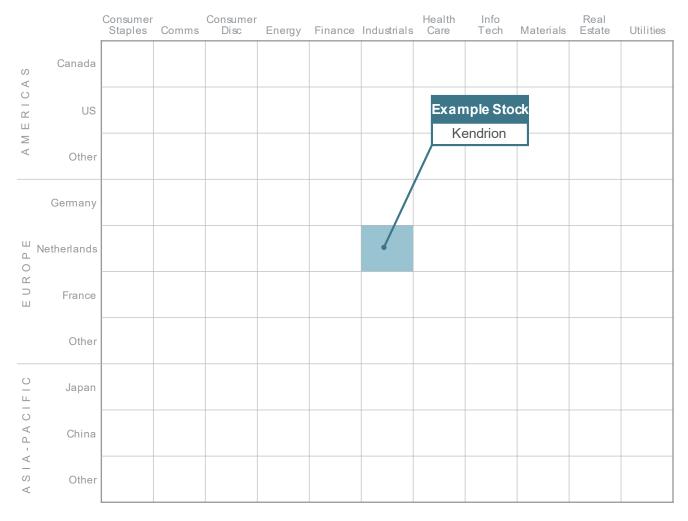
Influence of Stock Information

Signal Groups

Catalysts Momentum

Extreme Sentiment Quality

High Frequency Value



Data as of September 2019. Source: Arrowstreet Internal Databases.

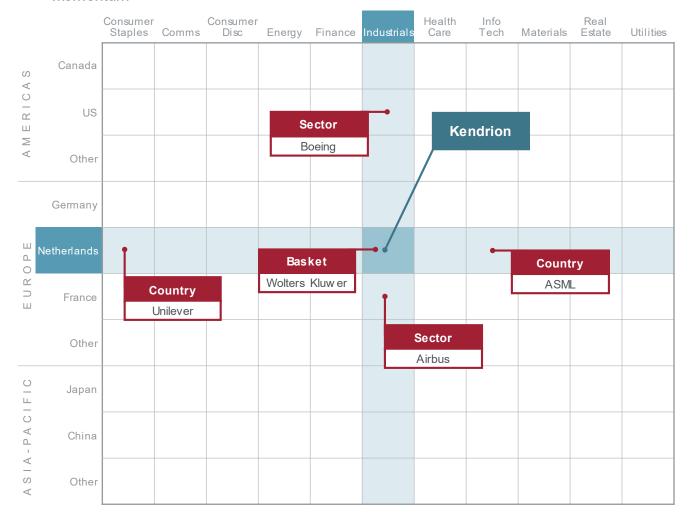


Defining Indirect Effects

Influence of Sector, Country & Basket Information

Signal Groups

- Catalysts
- **Extreme Sentiment**
- High Frequency
- Momentum



Data as of September 2019. Source: Arrowstreet Internal Databases.

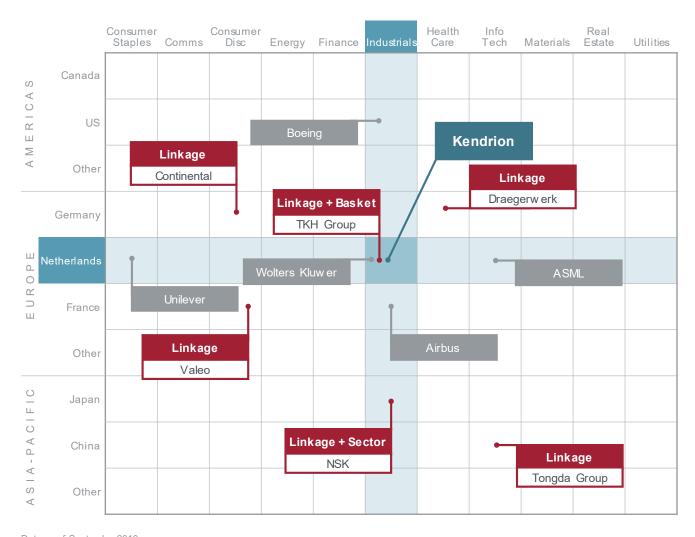


Enhancing Indirect Effects

Influence of Expanded Linkages

Signal Groups

- > Momentum
- > Value



Data as of September 2019. Source: Arrowstreet Internal Databases.



Portfolio Construction

Client Portfolios Built Considering Forecasts, Transaction Costs, and Risks

Alpha Forecasts for Portfolio Candidates

Transaction Costs

Reflecting trade size and expected holding period

Risk Estimates

Proprietary risk model

Target Position Limits

(Relative to the benchmark)

Country: +/- 10%

Sector: +/- 15%

Basket: +/- 5%

Stock: +/- 3%

Style Controls

Control portfolio tilts

Portfolio

Broadly Diversified

Style Neutral

Risk Controlled



Performance Attribution Disclosures

Cash Position:

The sum of the active portfolio shifts, inclusive of the active cash shift, may not sum to zero due to certain factors including, subscription or redemption activity in a given period.

Positions outside of the account's investible country universe may arise because of securities received through corporate actions. benchmark country re-classifications, country classifications that differ across benchmark providers, or other passive activities.

Portfolio Attribution: A Guide to Reading the Charts

Arrowstreet Capital, Limited Partnership's ("Arrowstreet") portfolio attribution measures performance simultaneously from a country, sector, basket, and stock perspective, consistent with the way we make our portfolio decisions. Analysis in this form is different from traditional country or sector based attribution, which implicitly assumes a manager's decision begins from a country or sector perspective and then moves to the selection of securities within each country or sector group.

Basket Based Performance Attribution

Each cell in the attribution table represents the combined value added (lost) from both the basket over- or under-weighting decision relative to the benchmark and active security selection within each basket using a geometric calculation methodology for the periods covered. Baskets with significant under-weight or over-weight positions (as defined by an active weight of greater than 15 bps or less than -15 bps) are displayed with shading while all others are displayed without shading.

Attribution Results

This section shows the key components of the realized cumulative results of all actual portfolio weights and characteristics (Portfolio Value Added):

Allocation value added estimates presented in the table are a function of daily basket weights and returns in excess of the benchmark. They represent the portion of the total portfolio value added that is attributed to Basket Selection.

Selection value added estimates presented in the table are a function of daily stock weights and returns in excess of the basket itself. They represent the portion of the total portfolio value added that is attributed to Active Stock Selection.

Currency Effects are the value added or lost from currency exposures that differ from those of the benchmark. Please see Note #6

Cash Effect reflects the value added (lost) as a result of cash held in the portfolio.

Compounding occurs during the geometric linking of historical attribution effects. Because subsequent portfolio and benchmark returns can distort intra period attribution results, we separately measure and account for this as the Compounding Effect.

Total Effect is the sum of Allocation, Selection, Currency Effects, and the Cash Effect. The Total Effect differs from actual Value Added because of the impact of Trading Costs and Unexplained Effects. This latter category is a residual.

Notes:

- 1. Arrowstreet's proprietary portfolio attribution system has been used to perform the attribution analysis.
- 2. The data is gross of all management and performance fees and include the reinvestment of dividends. Any fees and other expenses charged will reduce actual performance. The firm's management fees are described in our Form ADV Part 2A Brochure. For example, if an account appreciated by 10% each year for ten years with no fees deducted, the average annualized return would be 10%. If the account was charged investment management fees of 0.75% for each of the ten years, then the average annualized return would have been 9.18%. Past performance is no guarantee of future results.
- 3. MSCI GICS is the source for sector classification and the relevant index provider is the source for the country classification.
- 4. The pricing source primarily used by the Portfolio Attribution system is provided via Bloomberg, although alternate pricing sources (mainly MSCI, FTSE, Russell, Citi and State Street Bank) may be used where Bloomberg prices are not readily available.
- 5. All portfolio records are maintained by a third party middle office service provider (State Street Bank). The Portfolio Value Added number is computed using these records and the official benchmark return as provided by the relevant index provider. The difference between the official benchmark return and the benchmark return used in the attribution analysis, calculated from unofficial pricing sources, has been determined to usually be immaterial. This difference is included in the Trading Costs and Unexplained Effects line item in the Attribution Results section.
- 6. Arrowstreet employs its own proprietary definition for assigning currency exposure associated with each stock in dient portfolios and benchmarks. These definitions may, at times, be at odds with those of a particular benchmark provider and result in different assessments of the portfolios' active exposure towards currency lines.



Additional Disclosures

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Performance Endnotes:

[†] Target Value Added" represents our ex-ante objective for outperformance per year relative to the benchmark over a full market cycle (defined here for this purpose as 5 to 7 years) based upon our assessment of the available investment opportunities when the portfolio is managed at the applicable tracking error range. "Tracking Error" represents the typical expected range of annualized standard deviation of the difference between the portfolio return and the portfolio's benchmark return. "Info Ratio" (Information Ratio) is determined by dividing Target Value Added by our internal expectation of full market cycle average tracking error.



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Fidelity Institutional Asset Management Mandates (Hired): Tactical Bond (2014), Real Estate High Income (2015)

Firm Information	Investment Approach	Total ARM	B Mandate	& Fees
Fidelity Investments was founded in 1946 by Edward C. Johnson II. Fidelity is one	<u>Tactical Bond</u> : The Tactical Bond strategy is a multi-sector global fixed income strategy with an alpha target 1.25% - 2.50%. The portfolio's sector and duration	Assets Under	· Managemen	t (\$millions):
of the largest independently-owned investment management organizations in	exposures deviate significantly from the benchmark. The investment process uses both fundamental and quantitative approaches to identity relative value and construct the	Date	REHI	Tactical Bond
the world with over \$4.9 trillion in assets under management. The Johnson family	portfolio. The benchmark is Bloomberg Barclays US Aggregate. The Tactical Bond portfolio is in ARMB's Fixed Income Asset Class.	12/31/14 9/30/15	\$30	\$120 \$121
owns 49% of the firm; Fidelity employees		12/31/15	\$85	\$119
own the remainder.	Real Estate High Income (REHI): The REHI strategy is a real estate debt strategy that	12/31/16	\$204	\$131
	primarily invests in high yield commercial backed securities (CMBS). The strategy	12/31/17	\$215	\$139
	targets inefficiencies in CMBS and real estate capital structures. The strategy is based on fundamental research focused on property valuation, credit analysis, and relative value.	12/31/18	\$104	\$203
	The benchmark is Bloomberg Barclays CMBS ex-AAA Index. The REHI portfolio is in	12/31/19	\$216	\$364
	ARMB's Fixed Income Asset Class.	12/31/20	\$204	\$735
Key Executives:	ATTIVID 5 I IACC INCOME ASSEC Class.	3/31/21	\$210	\$963
Kristin Shofner, Senior Vice President Christine Thorpe, Senior Account Executive Jeffrey Moore, CFA and Michael Plage, CFA, Portfolio Managers, Tactical Bond Stephen Rosen and William Maclay, CFA, Portfolio Managers, Real Estate High Income		Fee Schedule Tactical Bon <=\$400MM. REHI: 80 Ba *15% discour threshold.	d: 32 Basis Po 22 Basis Point sis Points	s >\$400MM.*

Concerns: None

	3/31/2021 Performance (gross of fees)						
	Last Quarter	1-Year	3-Years Annualized	5-Years Annualized			
Tactical Bond	-2.32%	13.39%	6.55%	6.45%			
US Agg	-3.37%	.71%	4.65%	3.10%			
REHI	3.22%	20.44%	3.81%	4.36%			
CMBS ex-AAA	.35%	12.90%	5.72%	4.92%			

Fidelity Tactical Bond

Presentation to:

Alaska Retirement Management Board

Jeffrey Moore, CFA *Portfolio Manager*

Michael Plage, CFA
Portfolio Manager

Beau Coash Institutional Portfolio Manager

Kristin Shofner Senior Vice President, Business Development



Table of Contents

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- 2. Portfolio Performance and Positioning
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 - A. FIAM GIPS® Composite Report
 - B. Biographies
 - C. Important Information

Current performance may substantially differ from, and could be significantly lower than, performance shown due to recent significant market volatility. Please contact FIAM for updated performance numbers after the tenth business day following quarter end.

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See "Important Information" for a discussion of performance data, some of the principal risks related to any of the investment strategies referred to in this presentation, and other information related to this presentation.

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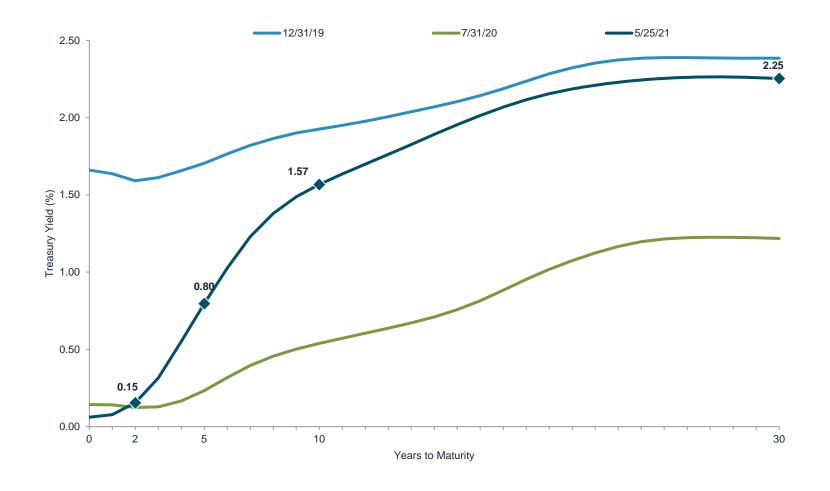


Market Environment



Treasury Curve Evolution During Pandemic

As of May 25, 2021



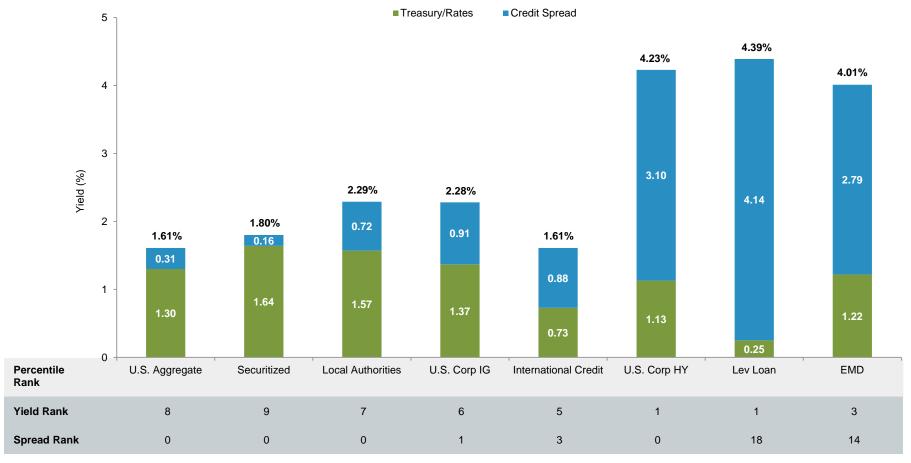


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Fixed Income Yields and Spreads

Percentiles and OAS



Percentile ranks based on month-end data from January 2009 – March 2021

Source: Bloomberg Barclays and S&P, as of 3/31/21.

Note: Leveraged Loan is based on YTM (yield to maturity) and Spread to Maturity. The green portion of leveraged loan represents London Interbank Offered Rate (LIBOR). All others use YTW (yield-to-worst) and OAS (option-adjusted-spread). Yields and spreads are represented by the Bloomberg Barclays U.S. Aggregate Bond Index, Bloomberg Barclays U.S. Securitized Index, Bloomberg Barclays U.S. Aggregate Local Authorities Index, Bloomberg Barclays Corporate Investment Grade Index, Bloomberg Barclays Global Credit Index, Bloomberg Barclays U.S. Corporate High Yield Index, S&P/LSTA Leveraged Performing Loan Index, and Bloomberg Barclays Emerging Markets USD Aggregate Index. It is not possible to invest directly in an index. All market indices are unmanaged. Not intended to represent the performance of any Fidelity portfolio.



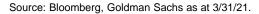
Easy Financial Conditions Support Reflation Expectations

Financial Conditions Index



Financial Conditions Index

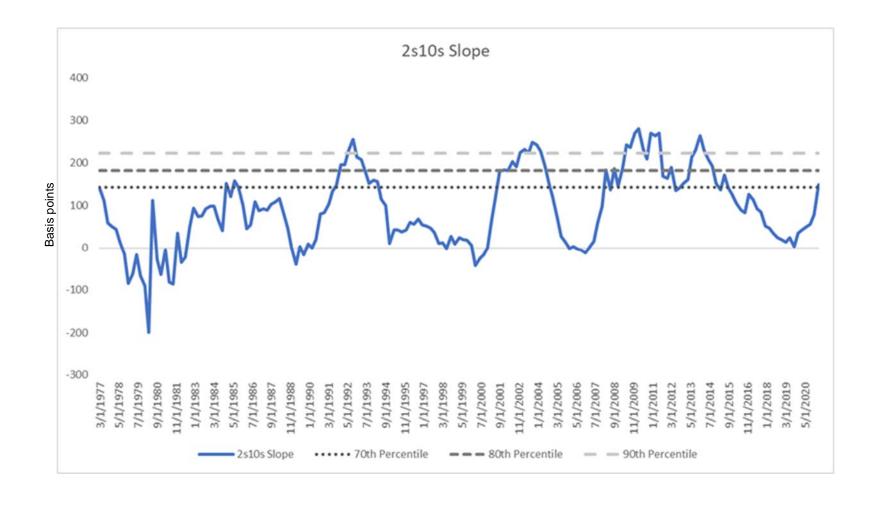




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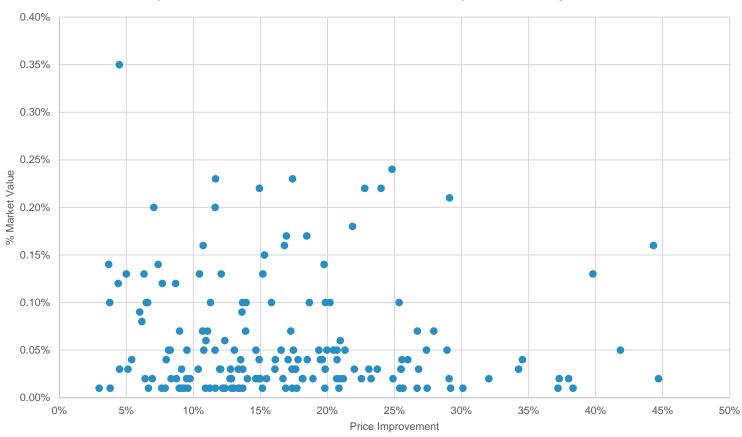
Yield Curve Steepness Heading to Extremes





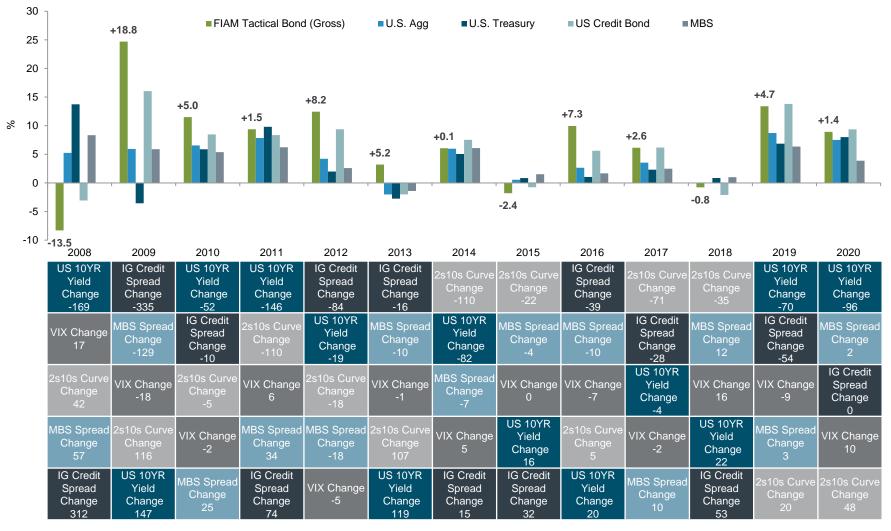
Sample of Core Team New Issue Activity







Annual Returns in Various Markets



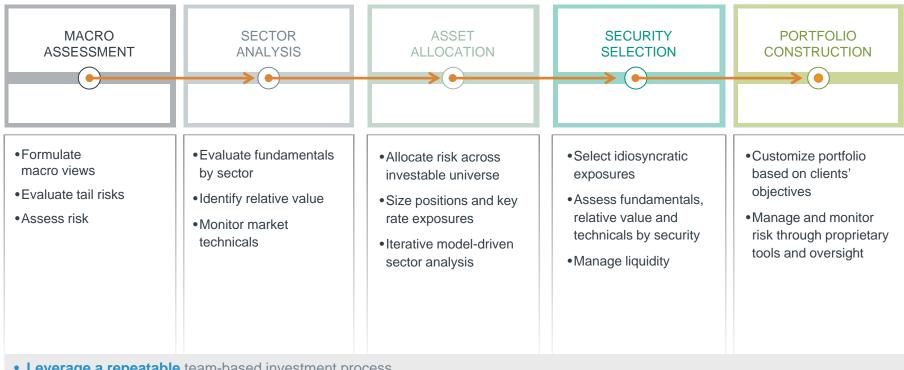
Note: Numbers next to the green bars represent the relative gross return for FIAM Tactical Bond to the Bloomberg Barclays U.S. Aggregate Index. Source: Fidelity Investments and Bloomberg as of 12/31/20. Performance shown is gross of any fees and expenses, including advisory fees, which when deducted will reduce returns. See the GIPS Composite Performance Data for annual performance figures that are net of the maximum investment advisory fee charged any client employing this strategy. Past performance is no guarantee of future results.

Portfolio Performance and Positioning



Investment Process

Disciplined process helps uncover global risk-adjusted return opportunities



- Leverage a repeatable team-based investment process
- Use multiple alpha levers including sector allocation, security selection, and yield curve positioning
- Rely on our competitive advantage in the fundamental, macro, and quantitative research process



State of Alaska Performance Review

Performance as of April 30, 2021

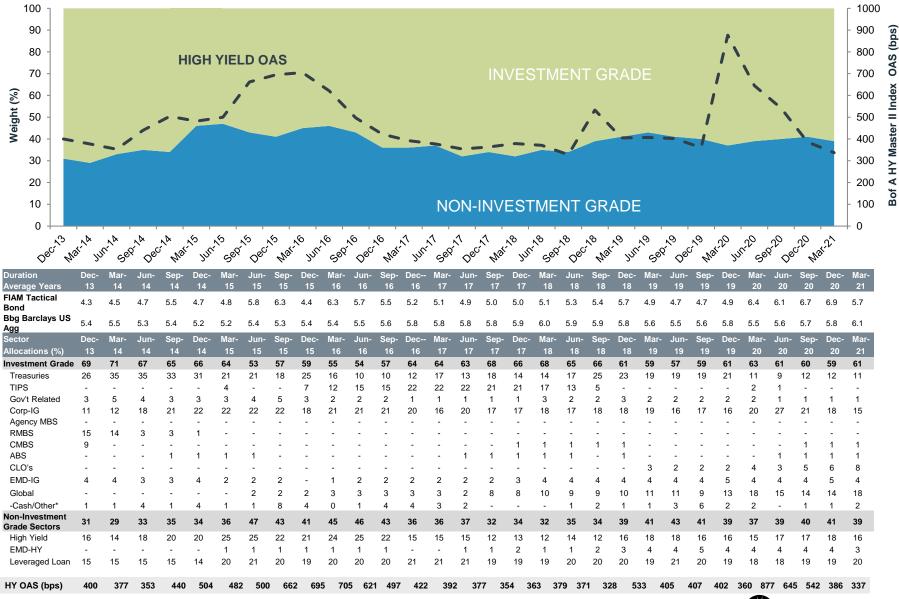
		Cumulative		Annualized				
	3-Month	YTD	1-Year	3-Year	5-Year	SI (10/07/2014)	TNA	Calendar Year 2020
State of Alaska Tactical Bond (Gross)	(0.59)	(1.24)	11.13	7.26	6.37	5.50	\$972.9 M	9.40
Bloomberg Barclays U.S. Aggregate Index	(1.91)	(2.61)	(0.27)	5.19	3.19	3.18		7.35
Active Return (Gross)	1.32	1.37	11.40	2.07	3.18	2.32		2.05

Client data shown.

Performance shown is gross of any fees and expenses, including advisory fees, which when deducted will reduce returns. Past performance is no guarantee of future results.



Tactical Bond Historical Exposures



^{*}Includes derivatives. Representative account information is shown. Data as of 3/31/21.





State of Alaska Tactical Bond Portfolio Positioning

As of April 30, 2021

	FIAM	Bloomberg Barclays U.S.	
Characteristics	Tactical Bond	Aggregate	Difference
YTW%	3.18%	1.47%	1.71%
Duration (yrs)	6.15	6.12	0.03
Sector Allocation (%)			
U.S. Treasuries	14.95	37.22	(22.27)
TIPS	0.00	0.00	0.00
Gov't Related	1.24	6.13	(4.89)
Corporate	27.52	26.64	0.88
Investment Grade	14.81	26.64	(11.82)
Financials	7.30	8.02	(0.72)
Industrials	7.50	16.44	(8.94)
Utilities	0.02	2.18	(2.16)
High Yield	12.71	0.00	12.71
Securitized	9.96	28.74	(18.79)
Agency MBS	0.00	26.25	(26.25)
Non-Agency MBS	0.01	0.00	0.01
CMBS	0.64	2.17	(1.54)
Consumer ABS	1.20	0.32	0.88
CLO's	8.12	0.00	8.12
Emerging Market Debt	6.86	0.00	6.86
Leveraged Loans	19.66	0.00	19.66
Global Credit	18.12	0.00	18.12
Cash/Other	1.69	1.26	0.43
Total	100.00%	100.00%	

Investment Grade	FIAM	Bloomberg Barclays U.S.	
Corporate Allocation (%)	Tactical Bond	Aggregate	Difference
Consumer Cyclical	2.38	1.80	0.58
Finance Companies	0.72	0.29	0.43
Banking	5.77	5.48	0.29
Capital Goods	1.55	1.56	(0.01)
Natural Gas	0.00	0.14	(0.14)
Other	0.00	0.19	(0.19)
REITS	0.47	0.73	(0.26)
Brokerage	0.00	0.32	(0.32)
Transportation	0.23	0.65	(0.42)
Basic Industry	0.00	0.75	(0.75)
Insurance	0.35	1.19	(0.84)
Communications	1.33	2.56	(1.23)
Electric	0.02	1.99	(1.98)
Energy	0.25	2.15	(1.90)
Consumer Non-Cyclical	1.71	4.27	(2.56)
Technology	0.05	2.57	(2.52)
Total	14.82%	26.64%	

Ratings Allocation (%)			
AAA	22.12	71.02	(48.90)
AA	6.75	4.65	2.11
Α	2.45	12.64	(10.20)
BBB	31.42	11.70	19.73
BB	22.89	0.00	22.89
В	12.26	0.00	12.26
CCC	1.24	0.00	1.24
NR/Other	0.86	0.00	0.86
Total	100.00%	100.00%	

Client data shown.

Cash/Other may include cash and derivatives. Ratings are based on highest of Moody's, S&P, and Fitch ratings.

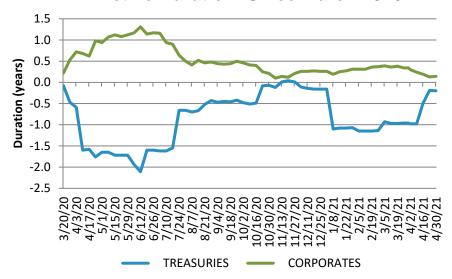
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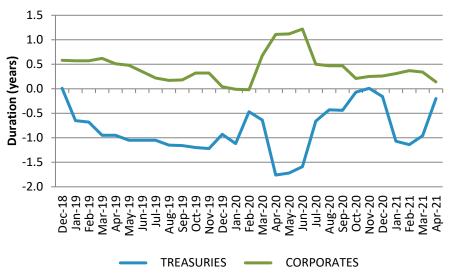
Asset Allocation Tactical Bond

As of April 30, 2021

Active Duration: Since March 2020



Active Duration: Since 12/31/2018



Client data is shown.

Source: Fidelity Investments, Bloomberg Barclays.



FIAM Tactical Bond Strategy

Macroeconomic views

The Big Story

How do you decide "what investment outcomes to worry about?" A simple list is an easy starting place, although to be worthwhile it requires a notion of time horizon, scope of the issue, and an uncertainty variable. For instance, March 2020 was a significant market moving event, to say the least. The scope became all of GDP. Timing was imminent, forcing prices to adjust super fast. Uncertainty in the market was maximized, perhaps best illustrated by hoarding fears (recall that hoarding is very problematic because there is no market clearing price). Compare this event to the list of investment worries you might have had in January 2020. One was decisive, all the rest investment noise.

Today, a simple list of concerns might include global central bank policy, evolving inflation expectations, sovereign debt sustainability, higher taxation, climate outcomes and regulation, mutating covid, extended asset valuations, inequality of income and opportunity, G10 aging and population decline. What is unknowable is the one single concern or combination that might prove turning points.

Our 5 step process expends copious energy searching for and talking about downside risk. We are bond managers after all! We employ a 360 degree view of risk, relying on our battle tested teammates across macro, sector and security selection. Our process also quantitatively stress tests the portfolio for big, unexpected, market moves, such as the stock market down 20% in 3 months or interest rates up 100 bps in a few months. Our goal is to see how exposed the portfolio is to surprise, to adjust as necessary and, perhaps as importantly, to generate a roadmap response function should the event, like a March 2020, transpire. Our goal is reliable alpha generation and effective Sharp ratios.

The Federal Reserve

Chair Powell has been very visible of late, stating that inflation expectations remain anchored and that no change in policy, including tapering, is in the offing. No change to easy financial conditions. The steep yield curve suggests the market disagrees to an extent, although Chair Powell can take solace that the curve prices in 3 hikes by 2023 and risk markets remain confident.

Bank of Canada

Governor Macklem is the first major country to curtail QE (bond buybacks will slow from \$4B/m to \$3B/m) and suggest a rate hike in 2022. The Canadian yield curve is so steep right now that this statement caused barely a ripple in bond markets.

Bank of Japan

Governor Kuroda continues to make tweaks to the trading range around YCC and allow reflation expectations to steepen the JGB curve. To date, JGB yield curve volatility is at 0.5%, rivaling the lowest volatility in the past ten years. In contrast the UST 10-year has volatility north of 5%, about average.

European Central Bank

No change to policy. Europe GDP recovery has been fragile but the pace of vaccinations is picking up, which should help economies reopen. Long term, a few member countries could face debt sustainability issues should rates rise too far too fast.

People's Bank of China (PBoC)

No change to policy. PBoC is trying to thread the needle between growth and maintaining credit in line with nominal GDP growth, so as not to fuel the bubble.

Portfolio positioning, as May 2021.

Source: Fidelity. For illustrative purposes only. The statements and opinions are subject to change at any time, based on market and other conditions.. Actual results will depend on market conditions over a full market cycle and any developments that may affect these investments and will be reduced by the deduction of any fees and expenses associated with the investment.



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FIAM Tactical Bond Strategy

Portfolio positioning

Valuations

Leveraged Loans: Maintain overweight. Remains best performing asset class YTD given protection from rising rates due to floating rate structure, among highest yield in fixed income, spread compression due to low expected defaults and technical demand. Energy exposure in the sector is limited. CLO Issuance supportive. Complements treasury exposure.

High Yield: Continue to reduce. Strong performance YTD, demonstrating low empirical sensitivity to Treasuries. Beta trade largely played out so shifting exposure to idiosyncratic risk – specifically BB rated issuers with strong or improving fundamentals that have a yield advantage versus investment grade corporates.

U.S. Investment-Grade (IG) Corporates: Underweight. Spreads have retraced to near all time tights and offer little value. In addition, the correlation to treasuries is high and duration for this sector is long, both negatives based on our outlook and reasons the sector is the worst performer YTD. Today we return our focus to compelling idiosyncratic opportunities, primarily in the intermediate maturity BBB rated space.

International Credit: Maintain overweight. Another way to reduce the portfolio impact of higher US treasury rates as sector is primarily exposed to EUR or GBP curves. High spread dispersion provides opportunity for alpha from security selection and hedging provides some positive carry. Prefer shorter duration BBB rated industrials and down in the capital structure exposure to financials.

Emerging-Market Debt: Highly selective exposure. Popular indices are high quality and long duration, therefore have a high degree of correlation to treasuries and have underperformed YTD. We are focused on large, liquid BB and BBB rated sovereign and quasi sovereign issuers. Most exposure is USD denominated or hedged to control volatility.

U.S. TIPS: No exposure. Real interest rates are negative and rising, albeit slowly, across the curve. Within the Average Inflation Targeting framework outlined by the Fed at Jackson Hole, the narrative of significant fiscal and monetary stimulus combined with economic optimism as vaccinations continue has driven break-evens in 10yr TIPS to 2.4%, well above the Fed target of 2%. Longer term, global DM demographics and an increasingly debt laden US balance sheet are headwinds for growth and higher inflation. Reflation trade is extremely popular, so this is a contrarian view.

Structured Product: Adding exposure selectively. Most high-quality sectors have recovered to near pre COVID levels, including AAA CLOs, conduit CMBS, and other ABS sub sectors. Securitized products with COVID impacted collateral (real estate, airplanes, whole businesses, etc.) still offer value in some parts of the capital structure.

Agency MBS: No exposure. Low OAS negatively convex sector that has had the additional issue of being in a super-fast yet difficult to accurately predict prepayment environment. Negative convexity of this sector is in focus as rapidly rising base rates have caused the duration of MBS to extend.

Duration/Curve: Adding duration (close to neutral to the benchmark) given the dramatic underperformance of long duration treasuries (among worst quarters in the last decade) as reflation trade drives nominal yields higher. Starting to focus on 10-year bonds given the steepness of the curve.

Non-Dollar: Volatility of unhedged currency is usually multiples of our total portfolio risk. This keeps our exposure small. The G10 zero-yield front-end interest rate policy means that no country is a high-yielder, although the U.S. is widening the gap. This should keep a lid on FX movements due to interest rate parity. We have selectively added to MXN Peso and C\$.

Risk and Return Targets

Yield Target: 3.00% (-25bp)

Duration Target: about 6 years (neutral to the Bloomberg Barclays U.S. Aggregate Bond Index) **Volatility Target**: modestly higher than Bloomberg Barclays U.S. Aggregate Bond Index

Targeted Risk to Risk-Free Asset Ratio: 78%/22% (-2% / +2%)

Portfolio positioning, as of May 2021. Source: Fidelity. For illustrative purposes only. The statements and opinions are subject to change at any time, based on market and other conditions.. Actual results will depend on market conditions over a full market cycle and any developments that may affect these investments and will be reduced by the deduction of any fees and expenses associated with the investment.



Appendix



FIAM GIPS® Composite Report

Tactical Bond Total Composite (USD) Versus Bloomberg Barclays U.S. Aggregate Bond Index As of March 31, 2021

Period	Composite Return (Gross%)	Composite Return (Net%)	Benchmark Return (%)	Value Added (%)*	Number of Portfolios	Total Composite Assets End of Period (\$M)	Composite 3 Year Standard Deviation (Gross%)	Benchmark 3 Year Standard Deviation (%)	Asset Weighted Standard Deviation (Gross%)	Total Firm Assets(\$B)
2021 YTD	(2.57)	(2.67)	(3.37)	0.80	12	18,730	6.05	3.56	N/A	N/A
2020 Annual	8.96	8.52	7.51	1.45	12	18,509	5.97	3.40	0.57	1089
2019 Annual	13.36	12.90	8.72	4.64	12	11,158	2.56	2.91	0.34	960
2018 Annual	(0.76)	(1.16)	0.01	(0.77)	10	8,454	3.26	2.88	0.30	705
2017 Annual	6.14	5.72	3.54	2.60	9	6,895	3.76	2.81	0.14	613
2016 Annual	9.95	9.51	2.65	7.30	8	5,741	4.05	3.02	0.54	552
2015 Annual	(1.80)	(2.19)	0.55	(2.35)	8	4,719	3.73	2.92	0.28	603
2014 Annual	6.05	5.62	5.97	0.08	6	1,370	3.33	2.67	N/A	742
2013 Annual	3.20	2.78	(2.02)	5.22	less than 5	249	3.18	2.75	N/A	737
2012 Annual	12.45	12.07	4.21	8.24	less than 5	145	2.52	2.42	N/A	669
2011 Annual	9.37	9.01	7.84	1.53	less than 5	91	3.85	2.82	N/A	665

^{*} Value Added is calculated by taking the gross composite return less the benchmark return.

Definition of the "Firm"

For GIPS purposes, the "Firm" includes: (1) all of the portfolios managed by the investment management units of the Fidelity Institutional Asset Management group of companies (FIAM) excluding certain portfolios that primarily invest in real property; and (2) portfolios managed by FIAM's affiliates, Fidelity Management & Research Company LLC and its subsidiaries and the fixed income portfolios of Fidelity Management Trust Company (FMTC), that are also substantially similar to institutional mandates advised by FIAM and managed by the same portfolio management team.

Changes to Definition of the "Firm"

Changes to Definition or the "Firm" Effective January 1, 2021 the firm was redefined to exclude FIAM's management of certain portfolios that primarily invest in real property. Effective January 1, 2020, certain Fidelity investment advisers in the Firm definition were re-organized and re-named. Effective January 1, 2016, the definition of the Firm was revised to include substantially similar fixed income investment strategies managed by FMTC and the same portfolio management team. Effective November 20, 2015, the Firm name was changed from Pyramis Global Advisors to Fidelity Institutional Asset Management (FIAM). Effective January 1, 2013, the definition of the Firm was revised to include subsidiaries of FMR Co. Effective January 1, 2011, the definition of the Firm was revised to include subsidiaries of FMR Co. Effective January 1, 2011, the definition of the Firm was revised to include substantially similar investment strategies managed by FMR Co. and/or FIMM and the same portfolio management team.

The Firm claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. The firm has been independently verified for the periods January 1, 1990 through December 31, 2019. The verification report(s) is/are available upon request. A firm that claims compliance with the GIPS standards must establish policies and procedures for complying with all the applicable requirements of the GIPS standards. Verification provides assurance on whether the firm's policies and procedures related to composite and pooled fund maintenance, as well as the calculation, presentation, and distribution of performance, have been designed in compliance with the GIPS standards and have been implemented on a firm-wide basis. Verification does not provide assurance on the accuracy of any specific performance report. GIPS® is a registered trademark of CFA Institute. CFA Institute does not éndorsé or promote this organization, nor does it warrant the accuracy or quality of the content contained herein. The Firm's list of composite descriptions and pooled fund descriptions for limited distribution pooled funds is available upon request. Policies for valuing investments, calculating performance, and preparing GIPS reports are available upon request.

Gross composite returns do not reflect the deduction of investment advisory ("IA"), administrative or custodial fees, but Gross composite returns do not reliect the deduction of investment advisory (1A1), administrative or custodial rees, but do include trading expenses. Net composite returns are calculated by deducting the maximum standard IA fee that could have been charged to any client employing this strategy during the time period shown, exclusive of performance fee or minimum fee arrangements. IA fees paid by a client vary depending upon a variety of factors, including portfolio size and the use of any performance fee or minimum fee arrangement. Actual returns will be reduced by the IA fee and any administrative, custodial, or other fees and expenses incurred. Returns could be higher or lower than those shown. A client's fees are generally calculated based on the average month-end assets at market value during the quarter as calculated by the Firm, and are billed quarterly in arrears. More information regarding fees is available upon request. These investment performance statistics were calculated without a provision for any income taxes.

Composite Description

The investment objective of this composite is to achieve competitive total returns by exercising broad flexibility to invest in a broad set of fixed income sectors. The strategy will seek to generate returns from the allocation among a full suite of global fixed income investments including high yield corporates, emerging market debt (hard and local currency), leveraged loans, non-agency mortgages, high yield CMBS, convertible bonds, preferred stock and hybrid securities. The strategy seeks to generate returns from asset allocation, sector rotation, security selection, duration management, yield curve positioning and foreign currency exposures. The composite is composed of all fee-paying discretionary accounts that are managed by the Firm in this style. This is a total composite which is comprised of two or more underlying sub-composites.

Composite Inception and Creation Date

The inception date of this composite is January 31, 2006. This composite was created on July 15, 2017.

Limited Distribution Pooled Funds

The composite contains one or more limited distribution pooled funds ("LDPF") whose performance is presented net of custody, audit, and other administrative fees. Investment securities transactions for the pool portfolio are accounted for on trade date-plus-one. LDPF names are not included in order to comply with law and regulation which restricts the offer of the LDPF to certain eligible investors or prohibits any offer. Fees and expenses of each LDPF are described in each LDPF's offering and account opening documents and financial statements.

Fee Schedule

The maximum scheduled investment advisory fee for this strategy is 40 basis points, which may be subject to certain decreases as assets under management increase. The investment advisory fee applicable to a portfolio depends on a variety of factors, including but not limited to portfolio size, the level of committed assets, service levels, the use of a performance fee or minimum fee arrangement, and other factors.

Effect of Investment Advisory Fee

Returns will be reduced by the investment advisory fee and any other expenses incurred in the management of the portfolio. For example, an account with a compound annual return of 10% would have increased by 61% over five years. Assuming an annual advisory fee of 40 basis points, the net return would have been 58% over five years.

Pooled Fund Fee Schedule

This composite includes a limited distribution pooled fund, whose maximum scheduled investment advisory fee is 36

Past performance is no guarantee of future results.

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Biographies

Jeffrey Moore, CFA

Portfolio Manager

Jeffrey Moore is a portfolio manager in the Fixed Income division at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing and other financial products and services to more than 26 million individuals, institutions and financial intermediaries.

In this role, Mr. Moore manages portfolios across retail and institutional assets, including managing Fidelity and Fidelity Advisor Investment Grade Bond Funds and Fidelity and Fidelity Advisor Total Bond Funds. Additionally, he is a presenting member to Fidelity's Asset Allocation Committee.

Prior to assuming his current position, Mr. Moore was a fixed income analyst assigned to several sectors, including sovereign debt, energy, real estate investment trusts (REITs), Yankee banks, and Canada.

Before joining Fidelity in 1995, Mr. Moore worked at Dominion Bond Rating Service in Toronto and at the Government of Canada's Department of Finance, Mr. Moore was selected into the Accelerated Economist Training Program, serving at the Treasury Board and at the Privy Council Office, He has been in the financial industry since 1990.

Mr. Moore earned his bachelor of arts degree, with honors, in economics from the University of Western Ontario and his master's degree in economics from the University of Waterloo. He is also a CFA charterholder.

Mr. Moore has authored a number of Thought Leadership papers, most recently "Active Multi-Sector Fixed Income Investing in an Uncertain Yield Environment" in 2013, "Stretching for Yield in the Fixed Income Market" in 2012, and "What Does Risk Free Mean Now?" in 2012. In Canada, he authored the paper "The Art and Science of Fixed Income" in 2009, and co-authored the paper "The Social Cost of Labor Taxes" for the Canadian Tax Journal in 1990. Additionally, Mr. Moore and team received Morningstar's 2016 U.S. Fixed-Income Manager of the Year Award for Fidelity Total Bond Fund.

Michael Plage, CFA

Portfolio Manager

Michael Plage is a portfolio manager in the Fixed Income division at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing and other financial products and services to more than 26 million individuals, institutions and financial intermediaries.

In this role, Mr. Plage manages institutional and retail Fixed Income portfolios within Core, Core Plus, and Tactical Bond strategies.

Prior to assuming his current responsibilities, Mr. Plage managed institutional and retail Fixed Income portfolios within credit strategies, including high yield. Previously, he worked as a Fixed Income trader at FMRCo from 2005 to 2009.

Before joining Fidelity in 2005, he was a trader at Travelers Insurance (Citigroup) from 1997 to 2005. He has been in the financial industry since 1997.

Mr. Plage earned his bachelor of science degree in management from the University of South Carolina and his master of business administration degree in finance from the University of Connecticut. He is also a CFA charterholder.



Biographies

Kristin Shofner

Senior Vice President, Business Development

Kristin Shofner is senior vice president of business development within the Asset Management Solutions division at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing, and other financial products and services to institutions, financial intermediaries, and individuals. The Fidelity Asset Management Solutions division is an integrated investment, distribution, and client service organization dedicated to meeting the unique needs of the institutional marketplace.

In this role, Ms. Shofner leads the development of relationships with public pension plans.

Prior to joining Fidelity in 2013, Ms. Shofner served as director of institutional sales and marketing at Lord, Abbett & Co. LLC. Previously, she served as manager of institutional sales and client services and as a manager research associate at Asset Strategy Consulting, later acquired by InvestorForce. She has been in the financial industry since 1998.

Ms. Shofner earned her bachelor of arts degree in history and sociology from the University of California at Santa Barbara where she ran Division I Cross Country and Track & Field. She was also a member of our United States Ekiden Relay Team in China and ran in the US Olympic Trials Women's Steeplechase in Atlanta.

Beau Coash

Institutional Portfolio Manager

Beau Coash is an institutional portfolio manager in the Fixed Income division at Fidelity Management & Research Company (FMR Co.), the investment advisor for Fidelity's family of mutual funds. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing and other financial products and services to more than 20 million individuals, institutions and financial intermediaries.

In this role, Mr. Coash is an active part of the portfolio management team and represents the team's capabilities, thought processes, and views to clients and consultants.

Prior to joining Fidelity as global head of syndicate and primary trading in FMR Co.'s Equity Trading division in 2005, Mr. Coash served as senior vice president in Corporate Bond Sales at Lehman Brothers. Previously, he was division head for business development at Replica/Preview Media and national sales manager at Knight Stations. Mr. Coash was also a professional football player for the New England Patriots and Boston Breakers. He has been in the investments industry since 1993.

Mr. Coash earned his bachelor of arts degree in history from Middlebury College and his master of business administration degree in entrepreneurship studies from Harvard Business School.



Important Information

The following information applies to the entirety of this document. Please read it carefully before making any investment. Speak with your relationship manager if you have any questions.

This document does not make an offer or solicitation to buy or sell any securities or services, and is not investment advice. FIAM does not provide legal or tax advice and we encourage you to consult your own lawyer, accountant, or other advisor before making an investment.

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Risks

Past performance is no guarantee of future results. An investment may be risky and may not be suitable for an investor's goals, objectives and risk tolerance. Investors should be aware that an investment's value may be volatile and any investment involves the risk that you may lose money.

The value of a strategy's investments will vary in response to many factors, including adverse issuer, political, regulatory, market, or economic developments. The value of an individual security or a particular type of security can be more volatile than and perform differently from the market as a whole. Nearly all accounts are subject to volatility in non-U.S. markets, either through direct exposure or indirect effects on U.S. markets from events abroad, including fluctuations in foreign currency exchange rates and, in the case of less developed markets, currency illiquidity. Events such as natural disasters, pandemics, epidemics, and social unrest in one country, region, or financial market may adversely impact issuers in a different country, region, or financial market. Performance could be required in the value of a portfolio holding were harmed by such political or economic conditions or events. Moreover, such negative political and economic conditions and events could disrupt the processes necessary for investment operations.

The performance of fixed income strategies will change daily based on changes in interest rates and market conditions and in response to other economic, political, or financial developments. Debt securities are sensitive to changes in interest rates depending on their maturity, and may involve the risk that their prices may decline if interest rates rise or, conversely, if interest rates decline, their prices may increase. Debt securities carry the risk of default, prepayment risk, and inflation risk. Changes specific to an issuer, such as its financial condition or its economic environment, can affect the credit quality or value of an issuer's securities. Lower-quality debt securities (those of less than investment-grade quality, also referred to as high-yield debt securities) and certain types of other securities are more volatile, speculative and involve greater risk due to increased sensitivity to adverse issuer, political, regulatory, and market developments, especially in periods of general economic difficulty. The value of mortgage securities may change due to shifts in the market's perception of issuers and changes in interest rates, regulatory or tax changes.

Derivatives may be volatile and involve significant risk, such as credit risk, currency risk, leverage risk, counterparty risk, and liquidity risk. Using derivatives can disproportionately increase losses and reduce opportunities for gains in certain circumstances.

The performance of international strategies depends upon currency values, political, and regulatory environments, and overall economic factors in the countries in which they invest. Foreign markets often are more volatile than the U.S. market due to increased risks of adverse issuer, political, regulatory, market, or economic developments and often perform differently from the U.S. market. Foreign exchange rates also can be extremely volatile. The risks are particularly significant for strategies that focus on a single country or region.

The securities, derivatives, and currency markets of emerging-market countries are generally smaller, less developed, less liquid, and more volatile than those of the United States and other developed markets, and disclosure and regulatory standards in many respects are less stringent. There also may be a lower level of monitoring and regulation of markets in emerging market countries and the activities of investors in such markets and enforcement of existing regulations may be extremely limited and arbitrary. Emerging-market countries are more likely to experience political uncertainty and instability, including the risk of war, terrorism, nationalization, limitations on the removal of funds or other assets, or diplomatic developments that affect investments in these countries. In many cases, there is a heightened possibility of government control of the economy, expropriation or confiscatory taxation, imposition of withholding taxes on interest payments, or other similar developments.

These materials contain statements that are "forward-looking statements," which are based on certain assumptions of future events. FIAM does not assume any duty to update any forward-looking statement. Actual events may differ from those assumed. There can be no assurance that forward-looking statements, including any projected returns, will materialize or that actual market conditions and/or performance results will not be materially different or worse than those presented.



Important Information, continued

Performance Data

Unless otherwise indicated performance data shown is client data. Performance data is generally presented gross of any fees and expenses, including advisory fees, which when deducted will reduce returns. All results reflect realized and unrealized appreciation and the reinvestment of dividends and investment income, if applicable. Taxes have not been deducted.

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Professional Designation

The Chartered Financial Analyst (CFA) designation is offered by the CFA Institute. To obtain the CFA charter, candidates must pass three exams demonstrating their competence, integrity, and extensive knowledge in accounting, ethical and professional standards, economics, portfolio management, and security analysis, and must also have at least four years of qualifying work experience, among other requirements.

Established in 1988, the Morningstar Fund Manager of the Year award recognizes portfolio managers who demonstrate excellent investment skill and the courage to differ from the consensus to benefit investors. To qualify for the award, managers' funds must have not only posted impressive returns for the year, but the managers also must have a record of delivering outstanding long-term risk-adjusted performance and of aligning their interests with shareholders'. Nominated funds must be Morningstar Medalists—a fund that has garnered a Morningstar Analyst Rating™ of Gold, Silver, or Bronze. The Fund Manager of the Year award winners are chosen based on research and in-depth qualitative evaluation by Morningstar's Manager Research Group. Morningstar's Manager Research Group consists of various wholly owned subsidiaries of Morningstar, Inc. including, but not limited to. Morningstar Research Services LLC, Analyst Ratings are subjective in nature and should not be used as the sole basis for investment decisions.

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Morningstar Awards 2017®, Morningstar, Inc. All Rights Reserved, Awarded to Ford O'Neil and team, Fidelity Total Bond Fund (FTBFX), for Fund Manager of the Year (2016), Fixed-Income, U.S. For the 2016 U.S. Fixed-Income Fund Manager of the Year award, Morningstar's Fixed-Income Fund Manager of the Year award recognized Ford O'Neil and team for Fidelity Total Bond Fund (FTBFX). Fidelity Advisor Total Bond Fund Classes A, C, M, I, and Z are classes of Fidelity Total Bond Fund and have different expense and performance characteristics as well as eliqibility requirements. See prospectus for more details.



Fidelity High Yield CMBS

June 18, 2021

Presentation to: State of Alaska Retirement Systems **Stephen Rosen** *Portfolio Manager*

William Maclay, CFA
Portfolio Manager

Andrew Rubin, CFA
Institutional Portfolio Manager

Kristin Shofner
SVP, Business Development
561-546-1886
kristin.shofner@fmr.com



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Current performance may substantially differ from, and could be significantly lower than, performance shown due to recent significant market volatility. Please contact FIAM for updated performance numbers after the tenth business day following quarter end.

This document does not make an offer or solicitation to buy or sell any securities or services, and is not investment advice. FIAM does not provide legal or tax advice and we encourage you to consult your own lawyer, accountant, or other advisor before making an investment.

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See "Important Information" for a discussion of performance data, some of the principal risks related to any of the investment strategies referred to in this presentation, professional designations and how they are obtained, and other information related to this presentation.





Fidelity High Yield CMBS



Real Estate Debt Team

Team Members	Title	Years of Experience	Years with Fidelity	Education	Selected Prior Professional Experience
Mark Snyderman, CFA	Portfolio Manager	34	27	M.B.A., Stanford University	AEW Capital Management
Stephen Rosen	Portfolio Manager	31	26	M.B.A., Columbia University	Heller Financial
William Maclay, CFA	Portfolio Manager	22	20	M.S.F., Boston College	Clarion Partners
Natalie Herald	Managing Director of Private Real Estate Debt	22	11	B.A., Bates College	KeyBank
Michael Murphy	Director of Private Real Estate Debt	11	6	B.S., New York University	Keystone Consulting Group
Adam Eisenberg	Research Analyst	11	9	M.A., Brandeis University	John Hancock
Janaki Stern	Research Analyst	9	0	M.A., Harvard University	Santander Bank
Matthew Torchia, CFA	Research Analyst	14	0	B.A., Dickinson College	Blackstone
Justin Lio	Research Associate	3	2	B.A., Cornell University	MIG Real Estate
Anna Nguyen	Operations Analyst	7	7	B.S., University of New Hampshire	Fidelity Investments
Brian Day, CFA	CMBS Trader	9	9	B.A., Colgate University	Fidelity Investments
Andrew Rubin, CFA	Institutional Portfolio Manager	18	11	M.B.A., Cornell University	Old Mutual Asset Management

Formed in 1994—group manages over \$10 billion on behalf of institutional and retail investors.

Stable and highly seasoned team—three portfolio manager's average 29 years of commercial real estate investment experience.

Boutique-like structure with the benefit of Fidelity's vast resources.

Consistent investment approach with a focus on deep credit research and analysis.

As of 5/31/21.

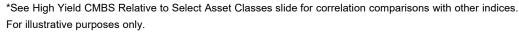
4 For institutional use only. 202105-28838



Key Strategy Points and Benefits

Seeks to outperform
the CMBS and high yield
corporate bond markets over a
full market cycle while
providing a high level of
current income and attractive
risk-adjusted total return.

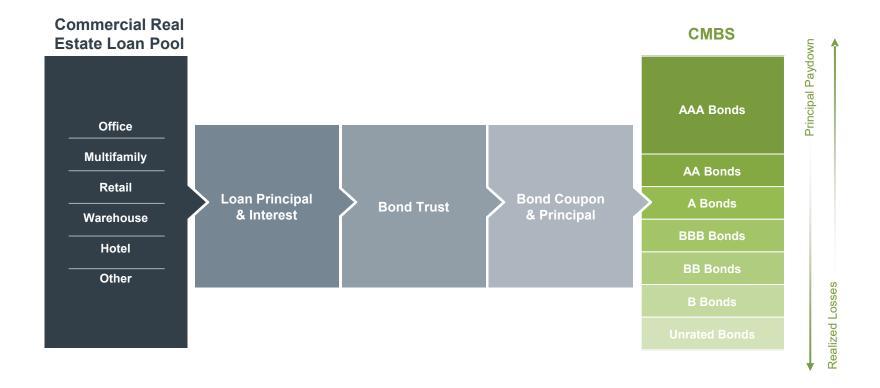
- Seeks to exploit the inefficiencies of the CMBS sector
- Uncorrelated* niche strategy with historically low volatility
- Consistent portfolio management team over 20+ year history
- Invests in a variety of higher-yielding real estate debt securities based on relative value
 - Primarily invests in high-yielding CMBS
 - Opportunistically invests in real estate company bonds, leveraged loans, and real estate preferred stock





Commercial Mortgage-Backed Securities

Securitization process





Investment Process



- Fundamental, bottom-up research process that entails loan-by-loan analysis
- Flexibility to move up and down capital structure based on risk/return characteristics and market conditions
- · Comprehensive on-site property due diligence
- Consistent investment process applied for more than 25 years



Case Study: Seasoned Conduit (Multi-Borrower) CMBS

Class	Original Balance	Current Balance	Original Credit Enhancement (%)	Current Credit Enhancement (%)	Credit Rating	Yield*
A-1	66,527,000	0	30.00	48.61	_	
A-2	118,410,000	0	30.00	48.61	_	
A-3	107,908,000	0	30.00	48.61	_	
A-4	470,955,000	343,801,578	30.00	48.61	Aaa	
A-S	85,928,000	85,928,000	22.13	35.76	Aaa	
В	54,557,000	54,557,000	17.13	27.61	Aa2	
С	40,918,000	40,918,000	13.38	21.49	A2	
D	25,915,000	25,915,000	11.00	17.62	Baa1	7.1%
E	49,101,000	49,101,000	6.50	10.28	Baa3	10.5%
F	17,731,000	17,731,000	4.88	7.63	Ba2	16.2%*
G	16,367,000	16,367,000	3.38	5.18	B2	19.5%*
Н	36,826,970	34,659,704	0.00	0.00	NR	

Total 1,091,143,970 668,978,282

Loan Summary		
	Original	Current
Balance	1,091,143,971	668,978,282
# of Loans	75	47

Remaining Loans			
Property Name	Current Loan Balance	% of Deal	City / State
The Domain	175,053,301	26.2%	Austin, TX
Arbor Walk and Palms Crossing	68,880,139	10.3%	Austin & McAllen, TX
Village of Rochester Hills	45,569,673	6.8%	Rochester Hills, MI
Renaissance NC	40,610,492	6.1%	Raleigh, NC
Madonna Plaza	34,194,746	5.1%	San Luis Obispo, CA





All figures are shown in USD.

Source: Fidelity, as of 4/19/21.



^{*}Yield: assumes loans extend 12 months.

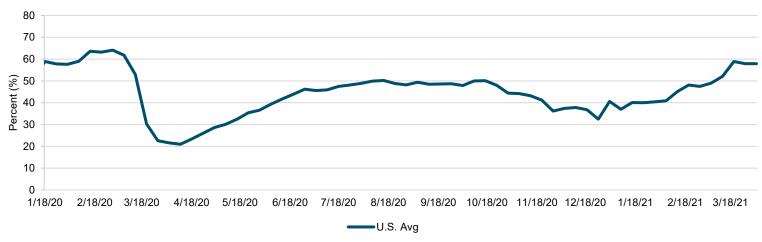
⁸ For institutional use only.

Commercial Real Estate Recovery Underway

Rental Collections¹

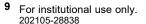
Property Type	2Q2020	3Q2020	4Q2020	January '21
Health Care	97%	98%	99%	99%
Industrial	97%	99%	99%	98%
Residential	95%	98%	98%	96%
Office	97%	98%	98%	98%
Triple Net Lease	89%	92%	95%	93%
Strip Centers	75%	88%	93%	92%
Malls	50%	74%	81%	NA
REIT Group Average Collections	88%	94%	96%	95%

Lodging Occupancy²



¹Source: Company Reports, JP Morgan, as of 1/31/21.

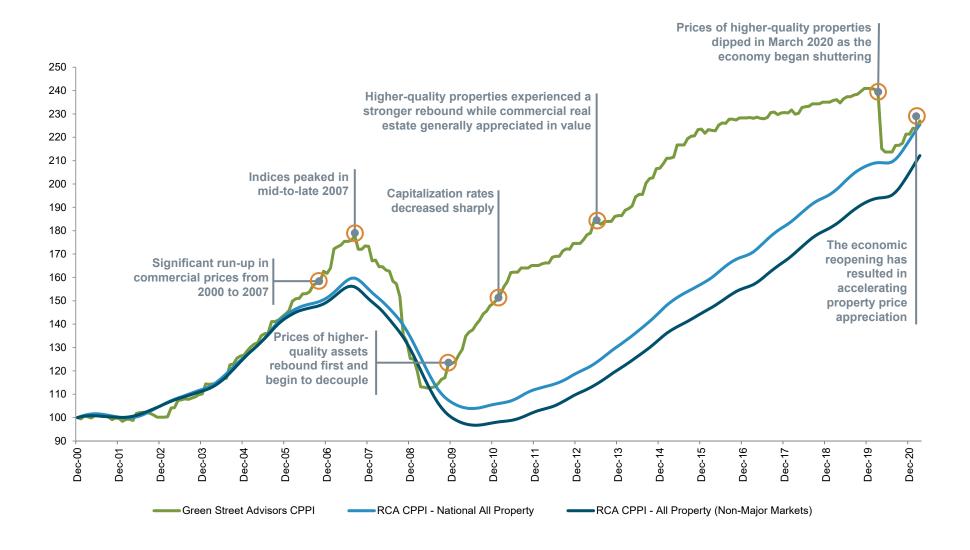
Past performance is no guarantee of future results.





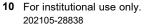
²Source: STR Weekly Data, as of 4/3/21.

U.S. Commercial Property Prices





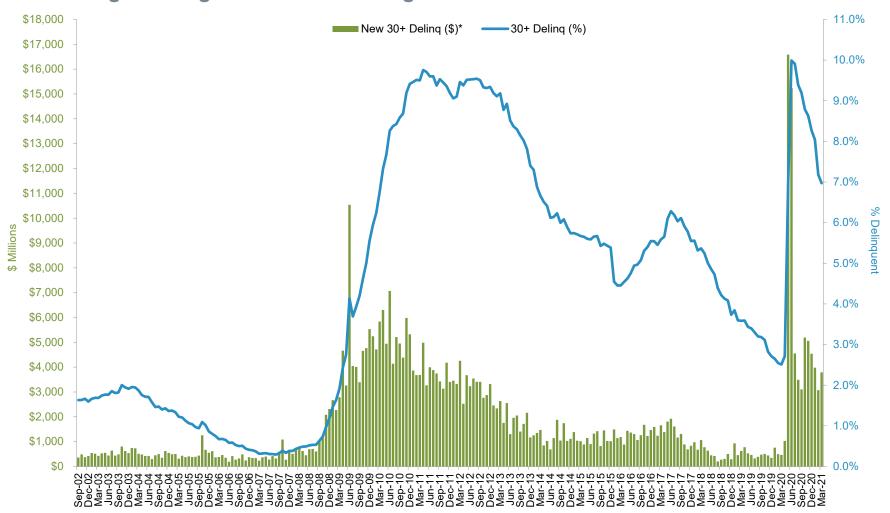
Sources: Green Street Advisors and RCA.





Historical CMBS Delinquencies

Virus-related closures and rent collection issues initially pushed delinquencies to all-time highs though recent loan curing has lowered the rate



^{*}Starting on 10/2020 actual 30+ delinquency data is shown.

As of 3/31/21.

Sources: Wells Fargo Securities, LLC, Trepp, and Intex Solutions Inc.

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Portfolio Characteristics

As of April 30, 2021

	Fidelity HY CMBS	Bloomberg Barclays CMBS Ex-AAA Index	ICE BofA HY Cash Pay Index*	BBgBarc U.S. Agg Bond Index*
Spread	625	196	322	51
Duration	2.6 years	4.9 years	3.6 years	6.4 years
Yield	7.2%	2.9%	4.1%	1.5%
Average Price	\$93.4	\$104.6	\$104.7	\$105.7
Quality	BB+	A+	B+	AA+

All figures are shown in USD.

Client account information is shown.

Past performance is no guarantee of future results.

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^{*}The primary benchmark for this strategy is the Bloomberg Barclays CMBS ex-AAA Index. The ICE BofA US HY Cash Pay Index, and Bloomberg Barclays Aggregate are shown for comparative purposes only. Data is unaudited.

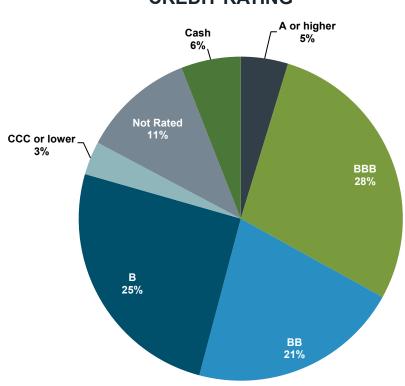
Portfolio Characteristics

As of April 30, 2021

INVESTMENT TYPE

Preferred/Common Equity RE Cash Bonds/Loans_ 6% 7% RMBS. <1% **Conduit CMBS** 41% Floating-Rate SASB CMBS 19% Fixed-Rate SASB CMBS 23%

CREDIT RATING



Client account information is shown.

Differences may amount due to rounding errors. Past performance is no guarantee of future results. Data is unaudited.

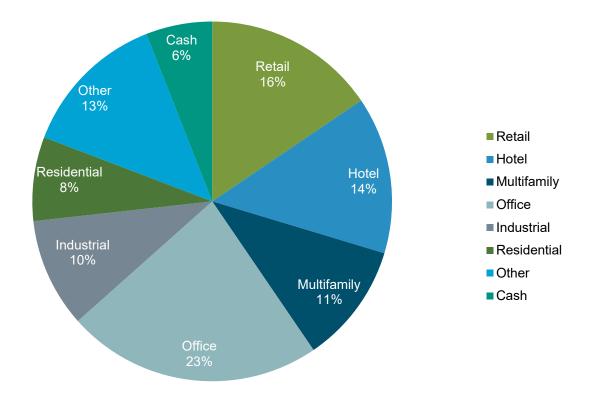
Ratings (Average of Moody's, S&P, Fitch, Kroll, DBRS, Morningstar).

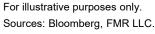
Source: Fidelity.

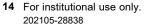
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Portfolio Characteristics—Property Type Allocation As of April 30, 2021









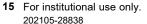
Investment Performance

As of April 30, 2021

	Cumulative	Annualized						
	YTD	1-Year	3-Year	5-Year	10-Year	20-Year	Since Inception*	
Real Estate High Income (Net) ¹	4.20	22.72	3.43	3.66	5.64	6.57	8.45	
Bloomberg Barclays CMBS ex-AAA Index ²	1.57	17.44	6.38	5.01	4.78	3.37	-	
ICE BofA US HY Cash Pay Index ²	1.91	19.94	6.67	7.30	6.25	7.49	7.54	
Bloomberg Barclays U.S. Aggregate Index ²	(2.61)	(0.27)	5.19	3.19	3.39	4.56	5.46	
Active Return (vs. Bloomberg Barclays)	2.63	5.28	(2.95)	(1.35)	0.86	3.20	_	
Active Return (vs. ICE BofA)	2.29	2.78	(3.24)	(3.64)	(0.61)	(0.92)	0.91	
Active Return (vs. BBgBarc U.S. Agg Bond)	6.81	22.99	(1.76)	0.47	2.25	2.01	2.99	

Client account information is shown.

²The primary benchmark for this strategy are the Bloomberg Barclays CMBS ex-AAA Index. The ICE BofA US HY Cash Pay Index and Bloomberg Barclays U.S. Aggregate index is shown for comparative purposes only. Inception of the Bloomberg Barclays CMBS ex-AAA Index was 7/31/99, subsequent to the inception of the Fidelity Real Estate High Income Fund. As a result, there is no relative return for the index based upon the fund's inception date.





^{*}Inception date was 1/5/95.

¹Net performance is less the maximum advisory fee charged any client employing this strategy; other fees and expenses may reduce returns. Past performance is no guarantee of future results. Investment return and principal value of an investment will fluctuate. Current performance may be higher or lower than the performance stated.

Appendix



High Yield CMBS Investment Performance—Calendar Years

As of December 31, 2020

		Annual Returns											
	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Real Estate High Income (Net)	(5.43)	9.52	2.88	5.79	2.52	2.84	9.45	5.95	18.41	8.40	25.71	28.75	(36.68)
Bloomberg Barclays CMBS ex-AAA Index¹	4.13	10.39	2.05	6.03	4.57	0.07	3.89	1.43	15.53	7.47	41.11	34.21	(62.33)
ICE BofA US High Yield Cash Pay Index*	6.20	14.40	(2.26)	7.48	17.34	(4.55)	2.45	7.38	15.44	4.50	15.24	56.28	(26.21)
Bloomberg Barclays U.S. Aggregate*	7.51	8.72	0.01	3.54	2.65	0.55	5.97	(2.02)	4.21	7.84	6.54	5.93	5.24
Active Return (vs. BBgBarc CMBS ex-AAA)	(9.56)	(0.87)	0.83	(0.24)	(2.05)	2.77	5.56	4.52	2.88	0.93	(15.40)	(5.46)	25.65
Active Return (vs. ICE BofA)	(11.63)	(4.88)	5.14	(1.69)	(14.82)	7.39	7.00	(1.43)	2.97	3.90	10.47	(27.53)	(10.47)
Active Return (vs. BBgBarc U.S. Agg Bond)	(12.94)	0.80	2.87	2.25	(0.13)	2.29	3.48	7.97	14.20	0.56	19.17	22.82	(41.92)

		Annual Returns											
	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995²
Real Estate High Income (Net)	(3.59)	8.90	8.95	18.66	12.17	16.10	12.14	16.46	7.76	(1.01)	26.92	18.24	21.43
Bloomberg Barclays CMBS ex-AAA Index ¹	(5.29)	8.18	4.73	8.58	5.24	19.40	10.13	17.60	_	_	_	_	_
ICE BofA US High Yield Cash Pay Index*	2.21	11.62	2.81	10.76	27.23	(1.14)	6.27	(3.85)	1.57	3.66	12.83	11.12	19.66
Bloomberg Barclays U.S. Aggregate*	6.97	4.33	2.43	4.34	4.10	10.25	8.44	11.63	(0.82)	8.69	9.65	3.63	18.50
Active Return (vs. BBgBarc CMBS ex-AAA)	1.70	0.72	4.22	10.08	6.93	(3.30)	2.01	(1.14)	_	_	_	_	_
Active Return (vs. ICE BofA)	(5.80)	(2.72)	6.14	7.90	(15.06)	17.24	5.87	20.31	6.19	(4.67)	14.09	7.12	1.77
Active Return (vs. BBgBarc U.S. Agg Bond)	(10.56)	4.57	6.52	14.32	8.07	5.85	3.70	4.83	8.58	(9.70)	17.27	14.61	2.93

^{*}The primary benchmark for this strategy is the Bloomberg Barclays CMBS ex-AAA Index. The ICE BofA US High Yield Cash Pay Index and Bloomberg Barclays Aggregate is shown for comparative purposes only.

Client account information is shown.

Net performance is less the maximum advisory fee charged any client employing this strategy; other fees and expenses may reduce returns. Past performance is no guarantee of future results. Investment return and principal value of an investment will fluctuate. Current performance may be higher or lower than the performance stated.

¹Inception of the Bloomberg Barclays CMBS ex-AAA Index was 7/31/99, subsequent to the inception of the composite. As a result, calendar 2000 is the first full period of relative performance.

²Performance is shown for a partial period of 1/31/95–12/31/95. Inception date was 1/5/95.



202105-28838



High Yield CMBS Relative to Select Asset Classes

As of April 30, 2021

RETURNS	3-Year Annual Return	5-Year Annual Return	10-Year Annual Return	20-Year Annual Return
Real Estate High Income (Net)	3.43	3.66	5.64	6.57
Bloomberg Barclays CMBS ex-AAA Index	6.38	5.01	4.78	3.37
ICE BofA US High Yield Cash Pay Index*	6.67	7.30	6.25	7.49
S&P/LSTA Leveraged Performing Loan Index*	4.37	5.18	4.47	4.95
JPM EMBI Global*	5.05	4.74	5.41	7.85
Bloomberg Barclays U.S. Aggregate*	5.19	3.19	3.39	4.56

VOLATILITY	3-Year Standard Deviation	5-Year Standard Deviation	10-Year Standard Deviation	20-Year Standard Deviation
Real Estate High Income (Net)	13.09	10.17	7.61	8.49
Bloomberg Barclays CMBS ex-AAA Index	8.46	6.93	5.61	12.86
ICE BofA US High Yield Cash Pay Index*	9.44	7.51	7.06	9.18
S&P/LSTA Leveraged Performing Loan Index*	9.16	7.11	5.61	6.93
JPM EMBI Global*	10.21	8.59	7.89	8.87
Bloomberg Barclays U.S. Aggregate*	3.50	3.32	3.03	3.44

DIVERSIFICATION	3-Year Correlation with REHI	5-Year Correlation with REHI	10-Year Correlation with REHI	20-Year Correlation with REHI
Bloomberg Barclays CMBS ex-AAA Index	0.93	0.91	0.88	0.84
ICE BofA US High Yield Cash Pay Index*	0.77	0.76	0.68	0.58
S&P/LSTA Leveraged Performing Loan Index*	0.84	0.83	0.80	0.68
JPM EMBI Global*	0.77	0.74	0.65	0.42
Bloomberg Barclays U.S. Aggregate*	0.19	0.21	0.23	0.14

^{*}The primary benchmark for this strategy is the Bloomberg Barclays CMBS ex-AAA Index. The ICE BofA US High Yield Cash Pay Index, S&P/LSTA Leveraged Performing Loan Index, JPM EMBI Global and Bloomberg Barclays Aggregate are shown for comparative purposes only.

Client account information is shown.

Inception date was 1/5/95.

Net performance is less the maximum advisory fee charged any client employing this strategy; other fees and expenses may reduce returns. Past performance is no guarantee of future results. Investment return and principal value of an investment will fluctuate. Current performance may be higher or lower than the performance stated.



Biographies

Stephen Rosen

Portfolio Manager

Stephen Rosen is a portfolio manager in the High Income and Alternatives division at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing, and other financial products and services to institutions, financial intermediaries, and individuals.

In this role, Mr. Rosen co-manages Fidelity Real Estate High Income Fund and the Real Estate Sub-Portfolio of Fidelity Total Bond Fund. He also manages numerous institutional accounts focused on real estate stock and bond investing.

Prior to assuming his current position in January 2000, Mr. Rosen was an analyst at Fidelity from 1995 to 1999.

Before joining Fidelity in 1995, Mr. Rosen worked as a real estate investment officer at Heller Financial from 1990 to 1995 and as an analyst at Towers, Perrin, Forster & Crosby from 1986 to 1988. He has been in the financial industry since 1990.

Mr. Rosen earned his bachelor of science degree in systems engineering from the University of Pennsylvania and his master of business administration degree in finance and real estate from Columbia University.

William Maclay, CFA

Portfolio Manager

William Maclay is a portfolio manager in the High Income and Alternatives division at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing, and other financial products and services to institutions, financial intermediaries, and individuals.

In this role, Mr. Maclay co-manages Fidelity Real Estate Income Fund, Fidelity Real Estate Opportunistic Income Fund, and Fidelity Real Estate High Income Fund, as well as a portion of Fidelity Strategic Real Return Fund and Fidelity Total Bond Fund. He also manages numerous institutional accounts focused on real estate stock and bond investing.

Prior to assuming his current position in February 2019, Mr. Maclay was a research analyst covering various segments of the real estate markets at Fidelity from 2001 to 2019.

Prior to joining Fidelity in 2001, Mr. Maclay was an analyst at Clarion Partners. He has been in the financial industry since 1999.

Mr. Maclay earned his bachelor of arts in finance from the University of Washington and his master of science in finance from Boston College. He is also a CFA® charterholder.



Biographies

Andrew Rubin, CFA

Institutional Portfolio Manager

Andy Rubin is an institutional portfolio manager at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing, and other financial products and services to institutions, financial intermediaries, and individuals.

In this role, Mr. Rubin serves as a member of the investment management team, maintaining a deep knowledge of portfolio philosophy, process, and construction, assisting portfolio managers and their CIOs in ensuring portfolios are managed in accordance with client expectations, and contributing to investment thought leadership in support of the team. Additionally, he is a principal liaison for portfolio management to a broad range of current and prospective clients and internal partners, providing detailed portfolio reviews and serving as a key conduit of client objectives, requirements, and marketplace insight back to the investment team. Mr. Rubin's focus is on Real Estate Equity and Debt.

Prior to joining Fidelity as a director of investment capability management in 2010, Mr. Rubin was an assistant vice president at Old Mutual Asset Management, where he served as an investment director in the Registered Investment Advisor (RIA) channel. Previously, Mr. Rubin was an investment consultant with Natixis Investment Managers. He has been in the financial industry since 2003.

Mr. Rubin earned his bachelor of science degree in finance from Lehigh University and his master of business administration degree from Cornell University's S.C. Johnson Graduate School of Management, He is also a CFA® charterholder.

Kristin Shofner

Senior Vice President, Business Development

Kristin Shofner is senior vice president of business development at Fidelity Institutional Asset Management (FIAM), Fidelity Investments' distribution and client service organization dedicated to meeting the needs of consultants and institutional investors, such as defined benefit and defined contribution plans, endowments, and financial advisors.

In this role, Ms. Shofner leads the development of relationships with public pension plans.

Prior to joining Fidelity in 2013, Ms. Shofner served as director of institutional sales and marketing at Lord, Abbett & Co. LLC. Previously, she served as manager of institutional sales and client services and as a manager research associate at Asset Strategy Consulting, later acquired by InvestorForce. She has been in the financial industry since 1998.

Ms. Shofner earned her bachelor of arts degree in history and sociology from the University of California at Santa Barbara where she ran Division I Cross Country and Track & Field. She was also a member of our United States Ekiden Relay Team in China and ran in the US Olympic Trials Women's Steeplechase in Atlanta.



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The value of a strategy's investments will vary in response to many factors, including adverse issuer, political, regulatory, market, or economic developments. The value of an individual security or a particular type of security can be more volatile than and perform differently from the market as a whole. Nearly all accounts are subject to volatility in non-U.S. markets, either through direct exposure or indirect effects on U.S. markets from events abroad, including fluctuations in foreign currency exchange rates and, in the case of less developed markets, currency illiquidity. Events such as natural disasters, pandemics, epidemics, and social unrest in one country, region, or financial market may adversely impact issuers in a different country, region, or financial market. Performance could be negatively impacted if the value of a portfolio holding were harmed by such political or economic conditions or events. Moreover, such negative political and economic conditions and events could disrupt the processes necessary for investment operations.

The performance of fixed income strategies will change daily based on changes in interest rates and market conditions and in response to other economic, political, or financial developments. Debt securities are sensitive to changes in interest rates depending on their maturity, and may involve the risk that their prices may decline if interest rates rise or, conversely, if interest rates decline, their prices may increase. Debt securities carry the risk of default, prepayment risk, and inflation risk. Changes specific to an issuer, such as its financial condition or its economic environment, can affect the credit quality or value of an issuer's securities. Lower-quality debt securities (those of less than investmentgrade quality, also referred to as high-yield debt securities) and certain types of other securities are more volatile, speculative and involve greater risk due to increased sensitivity to adverse issuer, political, regulatory, and market developments, especially in periods of general economic difficulty. The value of mortgage securities may change due to shifts in the market's perception of issuers and changes in interest rates, regulatory or tax changes.

Derivatives may be volatile and involve significant risk, such as credit risk, currency risk, leverage risk, counterparty risk, and liquidity risk. Using derivatives can disproportionately increase losses and reduce opportunities for gains in certain circumstances.

The real estate industry is particularly sensitive to economic downturns. The value of securities of issuers in the real estate industry can be affected by changes in real estate values and rental income, property taxes, interest rates, tax, and regulatory requirements, overbuilding, extended vacancies of properties, and the issuer's management skill. As a consequence, investments related to real estate may be more volatile than other investments. Mortgage-backed securities are subject to the risk that mortgagors may not meet their payment obligations and/or prepayment risk. Each investment also has its unique interest rate and payment priority characteristics.

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Important Information, continued

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Unless otherwise indicated performance data shown is client data. Performance data is generally presented gross of any fees and expenses, including advisory fees, which when deducted will reduce returns. All results reflect realized and unrealized appreciation and the reinvestment of dividends and investment income, if applicable. Taxes have not been deducted.

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Callan

ARMB 2021 Asset Allocation Strategy

June 18, 2021

Alaska Retirement Management Board

Paul Erlendson

Fund Sponsor Consulting

Steven Center, CFA

Fund Sponsor Consulting

Jay Kloepfer

Capital Markets Research

Adam Lozinski, CFA

Capital Markets Research

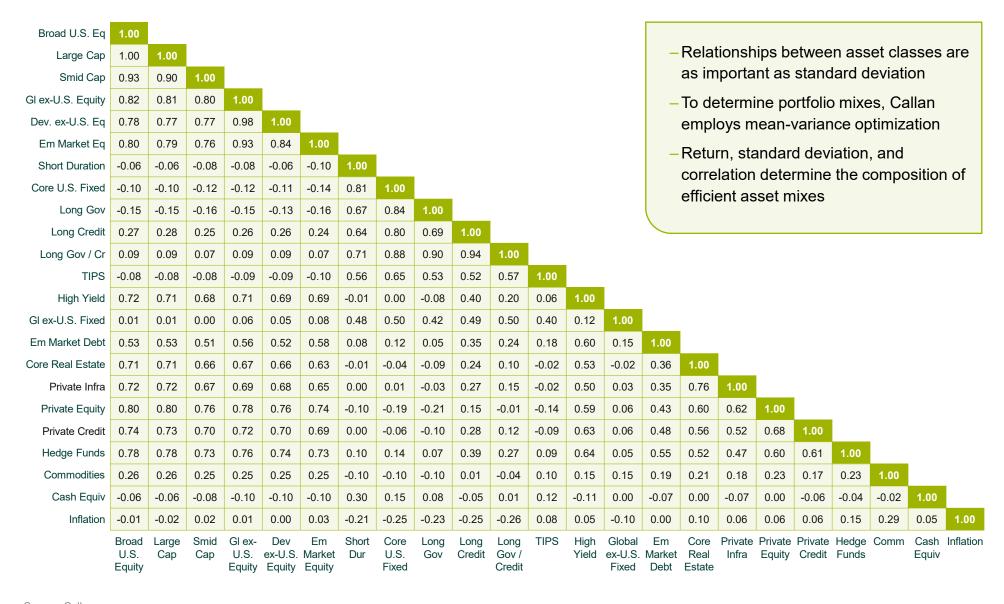
2021 vs. 2020 Callan Capital Markets Assumptions – Standard Set

		Projected Return			Projected Risk		2020–2029	
		1-Year	10-Year		Standard	1-Year	10-Year	Standard
Asset Class	Index	Arithmetic	Geometric*	Real	Deviation	Arithmetic	Geometric*	Deviation
Equities								
Broad U.S. Equity	Russell 3000	8.00%	6.60%	4.60%	17.95%	8.55%	7.15%	18.10%
Large Cap U.S. Equity	S&P 500	7.85%	6.50%	4.50%	17.70%	8.35%	7.00%	17.70%
Smid Cap U.S. Equity	Russell 2500	8.75%	6.70%	4.70%	21.30%	9.25%	7.25%	21.20%
Global ex-U.S. Equity	MSCI ACWI ex USA	8.70%	6.80%	4.80%	20.70%	9.10%	7.25%	20.50%
Developed ex-U.S. Equity	MSCI World ex USA	8.25%	6.50%	4.50%	19.90%	8.70%	7.00%	19.70%
Emerging Market Equity	MSCI Emerging Markets	9.80%	6.90%	4.90%	25.15%	10.25%	7.25%	25.70%
Fixed Income								
Short Duration Gov't/Credit	Bloomberg Barclays 1-3 Yr Gov / Credit	1.50%	1.50%	-0.50%	2.00%	2.70%	2.70%	2.10%
Core U.S. Fixed	Bloomberg Barclays Aggregate	1.80%	1.75%	-0.25%	3.75%	2.80%	2.75%	3.75%
Long Government	Bloomberg Barclays Long Government	1.35%	0.60%	-1.40%	12.50%	2.55%	1.80%	12.50%
Long Credit	Bloomberg Barclays Long Credit	2.95%	2.45%	0.45%	10.50%	3.75%	3.25%	10.50%
Long Government/Credit	Bloomberg Barclays Long Gov / Credit	2.30%	1.80%	-0.20%	10.35%	3.25%	2.75%	10.60%
TIPS	Bloomberg Barclays TIPS	1.80%	1.70%	-0.30%	5.05%	2.50%	2.40%	5.05%
High Yield	Bloomberg Barclays High Yield	4.85%	4.35%	2.35%	10.75%	5.10%	4.65%	10.25%
Global ex-U.S. Fixed	Bloomberg Barclays Global Agg xUSD	1.15%	0.75%	-1.25%	9.20%	1.30%	0.90%	9.20%
Emerging Market Sovereign Debt	EMBI Global Diversified	3.90%	3.50%	1.50%	9.50%	4.70%	4.35%	9.50%
Alternatives								
Core Real Estate	NCREIF ODCE	6.60%	5.75%	3.75%	14.10%	7.05%	6.25%	14.00%
Private Infrastructure	MSCI Glb Infra / FTSE Dev Core 50/50	7.00%	6.00%	4.00%	15.45%	n/a	n/a	n/a
Private Equity	Cambridge Private Equity	11.50%	8.00%	6.00%	27.80%	12.00%	8.50%	27.80%
Private Credit	n/a	7.15%	6.25%	4.25%	14.60%	n/a	n/a	n/a
Hedge Funds	Callan Hedge FOF Database	4.25%	4.00%	2.00%	8.00%	5.25%	5.00%	8.70%
Commodities	Bloomberg Commodity	3.80%	2.25%	0.25%	18.00%	4.30%	2.75%	18.00%
Cash Equivalents	90-Day T-Bill	1.00%	1.00%	-1.00%	0.90%	2.25%	2.25%	0.90%
Inflation	CPI-U		2.00%		1.50%		2.25%	1.50%

^{*} Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).



2021–2030 Capital Markets Assumption Correlations







Summary of Important Changes for 2021 Capital Markets Assumptions

- Cash return lowered to 1.0%
- Core fixed income return down 1.0%, to 1.75%
- Public equity returns down 45-55 bps; equity risk premium over both cash and fixed income widened
- Inflation lowered 25 bps to 2.0%
- Efficient smid cap weight set to 15% of broad U.S. equity
- Efficient emerging market equity weight set to 30% of global ex-U.S. equity
- Efficient U.S. / global ex-U.S. equity split to 60/40 neutral weight (not a change, but the market has now caught up to us!)
- Private markets returns lowered commensurate with public equity; hedge funds reflect starting cash return
- Ever-broadening set of diversifying asset classes to consider
 - Private credit
 - Private infrastructure
 - Inflation sensitive equity REITs, natural resources, global listed infrastructure



Customized ARMB Capital Market Projections – PERS & TRS Target

ARMB Asset Allocation Model 2021-2030

		PROJECTED RETURN		PROJECTED RISK	
Asset Class	Target Weight	1-Year Arithmetic	10-Year Geometric Return	Annualized Standard Deviation	Projected Yield
Public Equities	47.0%				
Broad US Equity	28.0%	8.00%	6.60%	17.95%	1.95%
Global Ex-US Equity	19.0%	8.70%	6.80%	20.70%	2.80%
Fixed Income	22.0%				
ARMB Fixed Income	22.0%	1.75%	1.70%	3.55%	2.43%
Opportunistic	6.0%				
Opportunistic	6.0%	5.45%	5.00%	10.60%	2.20%
Private Equity	12.0%				
Private Equity	12.0%	11.50%	8.00%	27.80%	0.00%
Real Assets	13.0%	6.80%	6.10%	13.10%	4.35%
Real Estate	4.88%	6.60%	5.75%	14.10%	4.40%
Timber	1.30%	6.45%	5.50%	14.95%	3.70%
Farmland	3.25%	6.60%	5.60%	15.10%	4.25%
Private Infrastructure	2.28%	7.00%	6.00%	15.45%	4.60%
REITs	1.30%	8.15%	6.20%	20.70%	4.65%
Cash Equivalents	0.0%				
Cash Equivalents	0.0%	1.00%	1.00%	0.90%	1.00%
Inflation			2.00%	1.50%	
Total Fund	100.0%	6.90%	6.15%	13.56%	2.32%

Projection set customized to reflect specific ARMB strategies:

• Real assets, opportunistic and fixed income

Current target projected to generate a return of 6.15% compounded over 10 years, at a risk (standard deviation) of 13.56%. This return is down from 6.79% projected last year.



Expanding the Length of the Forecast Horizon

10-Year vs. Equilibrium Capital Market Expectations

- As the time horizon grows beyond 10 years, our capital market expectations increasingly incorporate "equilibrium returns".
 Equilibrium returns reference <u>long-term historical mean results</u>, with an overlay of informed judgment. Key elements to consider:
 - Nominal returns
 - Inflation
 - Real returns
 - Risk premium bonds over cash, stocks over bonds, long duration over short
- Long-term underlying economic growth (real GDP)
- 10-Year expectations:
- Large Cap Stocks: 6.5% nominal, 4.5% real, 4.75% premium over bonds
- Bonds: 1.75% nominal, -0.25% real, 0.75 % premium over cash
- Cash: 1.0% nominal, -1.0% real
- Inflation: 2.0%
- Underlying economic growth (real GDP) 2 to 2.5% per year
- Equilibrium expectations:
- Large Cap Stocks: 8.40% nominal, 6.4% real, 3.45% premium over bonds
- Bonds: 5.1% nominal, 3.1% real, 2.05% premium over cash
- Cash: 3.05% nominal, 1.05% real
- Inflation: 2.0%
- Underlying economic growth (real GDP) 3% per year



As Time Horizon Increases, Expected Returns Increase

Transition from 10-Year to 20-Year Horizon – Heading Toward LT Equilibrium

AssetClass	2021-2030 10-Year Annualized Return	2021-2040 20-Year Annualized Return	2021-2050 30-Year Annualized Return	Long-Term Annualized Equilibrium Return	Projected Standard Deviation
Broad US Equity	6.60%	7.15%	7.60%	8.55%	17.97%
Large Cap US Equity	6.50%	7.05%	7.50%	8.40%	17.70%
Small/Mid Cap US Equity	6.70%	7.35%	7.95%	9.10%	21.30%
Global ex-US Equity	6.80%	7.40%	7.90%	8.90%	20.68%
Developed ex-US Equity	6.50%	7.05%	7.50%	8.35%	19.90%
Emerging Market Equity	6.90%	7.55%	8.20%	9.50%	25.15%
Core US Fixed	1.75%	2.65%	3.50%	5.10%	3.75%
ARMB Fixed Income	1.70%	2.60%	3.40%	5.00%	3.57%
Opportunistic	5.00%	5.70%	6.30%	7.45%	10.58%
Private Credit	6.25%	6.85%	7.25%	8.15%	14.60%
Core Real Estate	5.75%	6.30%	6.60%	7.40%	14.10%
Timber	5.50%	5.95%	6.35%	7.15%	14.95%
Farmland	5.60%	6.15%	6.45%	7.25%	15.10%
Private Infrastructure	6.00%	6.60%	7.05%	7.95%	15.45%
US REITs	6.22%	6.80%	7.20%	8.05%	20.70%
Real Assets	6.15%	6.65%	7.00%	7.85%	13.10%
Hedge Funds	4.00%	4.55%	5.00%	5.85%	8.00%
Private Equity	7.95%	8.30%	8.70%	9.60%	27.80%
Cash Equivalents	1.00%	1.60%	2.00%	3.05%	0.90%



Focus on 20-Year Horizon – PERS (\$20.2 b) & TRS (\$9.7 b at 3/31/21)

Achieve 4.88% Real Return over 20-Year Horizon

ARMB adopted new target portfolio following 2019 asset-liability study, refined in 2020

- Duration, cash flows and demographic forecasts suggest the investment time horizon for PERS and TRS remains long
- Current 10-year capital market forecasts can lead investors to take on substantial risk to meet a fixed return goal
- Extending the forecast horizon enabled the plans to moderate exposure to risk assets while still meeting the return target over this longer horizon
- New target altered the risk posture of the plans and acknowledged future liquidity needs

Portfolios optimized using broad US and non-US equity, broad US fixed income, real assets and private equity

- Opportunistic is modeled as 60/40 exposure to public market stocks and bonds
- Real assets modeled using current target weights to each component within the total real asset composite
 - 37.5% Real estate
 - 10% Timber
 - 25% Farmland
 - 17.5% Private Infrastructure
 - 10% REITs

ARMB fixed income modeled as 95% broad market (BB Aggregate) and 5% cash



Focus On 20-Year Horizon – PERS and TRS

Compare Return and Risk for 2021 Capital Market Assumptions vs. 2020

- Target adopted in 2020 represents a portfolio designed to meet the goal of 7.13% nominal/4.88% real return over 20 years
- Lower 2021 assumptions suggest a nominal return gap of 35 basis points, but a real return gap of only 10 basis points
- Inflation assumption is 2.0%, down from 2.25% projected in 2020
- Actuary's effective long term real return target is 4.88%
- Target shown at right is expected to generate a long-term (20-year) return that is close to (but just below) the plan's real return target (6.78% 2.00% = 4.78%)

	2021 Projection	2020 Projection
Broad US Equity	28	28
Global ex-US Equity	19	19
ARMB Fixed Income	22	22
Opportunistic	6	6
Real Assets	13	13
Private Equity	12	12
Totals	100.00	100.00
Projected Arithmetic Return	6.90%	7.51%
10-year Compound Return	6.15%	6.79%
Projected Standard Deviation	13.56%	13.55%
Projected Arithmetic Return	7.50%	7.83%
20-year Compound Return	6.78%	7.13%
Projected Standard Deviation	13.56%	13.55%
Real Return (2% inflation 2021,	4.78%	4.88%
2.25% in 2020)		
Equity	59%	59%
Fixed Income	22%	22%
Alts	25%	25%





Focus On 20-Year Horizon – PERS and TRS

Target 6.88% Nominal/4.88% Real Return

		Alternati	<i>l</i> e Targets					
							Public Market	
	Target	PE + 1%	PE, RA 14	Mix 1	Mix 2	Mix 3	Proxy	
Broad US Equity	28	28	27	27	30	33	45	
Global ex-US Equity	19	19	18	18	20	22	30	
ARMB Fixed Income	22	21	21	24	19	14	25	
Opportunistic	6	6	6	6	6	6	0	
Real Assets	13	13	14	13	13	13	0	
Private Equity	12	13	14	12	12	12	0	
Totals	100.00	100.00	100.00	100.00	100.00 100.00		100.00	
Projected Arithmetic Return	6.90%	7.00%	7.04%	6.74%	7.06%	7.39%	6.65%	
10-year Compound Return	6.15%	6.22%	6.25%	6.04%	6.26%	6.47%	5.89%	
Projected Standard Deviation	13.56%	13.81%	13.89%	13.11%	14.02%	14.94%	13.56%	
Projected Arithmetic Return	7.50%	7.59%	7.63%	7.35%	7.66%	7.97%	7.29%	
20-year Compound Return	6.78%	6.84%	6.88%	6.68%	6.88%	7.07%	6.56%	
Projected Standard Deviation	13.56%	13.81%	13.89%	13.11%	14.02%	14.94%	13.56%	
Real Return (2% inflation)	4.78%	4.84%	4.88%	4.68%	4.88%	5.07%	4.56%	
Equity	59%	60%	60%	57%	62%	67%	75%	
Fixed Income	22%	21%	21%	24%	19%	14%	25%	
Alts	25%	26%	28%	25%	25%	25%	0%	

Alternative Targets represent potential adjustments to the current plan target to meet the goal of 4.88% real return over 20 years

Mix 1 - Mix 3 show a broader range of mixes that by 5% increments to fixed income exposure, holding opportunistic, real assets and private equity at their current targets. Mix 2 represents a mix with (19.6% fixed income) expected to meet the 4.88% real return goal.

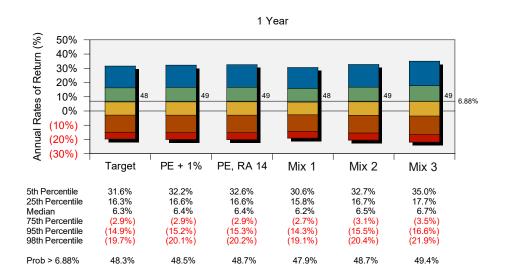
Public market proxy shows the expected return for a portfolio restricted to public markets and held to the risk (standard deviation) of the current target portfolio. Current target is expected to generate a greater return for the same level of risk as a portfolio restricted to the public markets.

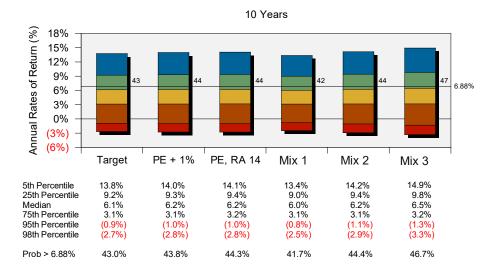


Impact of Risk Exposure on Range of Results

Expected case results vary between mixes, but in the context of variable capital markets, it's the tails of the distribution that matter

- Charts show the range of simulated returns for one year (upper chart) and ten years (lower chart)
- Reducing risk over one year limits the worse case outcome (98th percentile) – see Mix 1 vs. Mix 2
- Note that these charts do not address sequence risk, that the timing of a bad market matters. The projections fully anticipate recessions and market drawdowns as part of the path to a 10-year horizon.







Focus On 20-Year Horizon – PERS and TRS

Compare Return and Risk for Current Target and Potential Alternative Targets

- Target adopted in 2020 represents a portfolio designed to meet the goal of 7.13% nominal/4.88% real return over 20 years, using Callan's 2020 capital market assumptions
- Lower 2021 assumptions suggest a nominal return gap of 35 basis points, but a real return gap of only 10 basis points
- Alternative Targets represent potential adjustments to the current plan target to meet the goal of 4.88% real return over 20 years
 - "PE + 1%" increases private equity by 1%, funded from fixed income; this portfolio represents the current effective position of the ARMB portfolio exposure
 - "PE RA 14" increases private equity and real assets to 14% each while targeting the 4.88% real return
 - Both alternatives increase return relative to the current target, at the cost of higher risk (standard deviation)

		Alternative Targets					
	Target	PE + 1%	PE, RA 14				
Broad US Equity	28	28	27				
Global ex-US Equity	19	19	18				
ARMB Fixed Income	22	21	21				
Opportunistic	6	6	6				
Real Assets	13	13	14				
Private Equity	12	13	14				
Totals	100.00	100.00	100.00				
Projected Arithmetic Return	6.90%	7.00%	7.04%				
10-year Compound Return	6.15%	6.22%	6.25%				
Projected Standard Deviation	13.56%	13.81%	13.89%				
Projected Arithmetic Return	7.50%	7.59%	7.63%				
20-year Compound Return	6.78%	6.84%	6.88%				
Projected Standard Deviation	13.56%	13.81%	13.89%				
Real Return (2% inflation)	4.78%	4.84%	4.88%				
Equity	59%	60%	60%				
Fixed Income	22%	21%	21%				
Alts	25%	26%	28%				





Focus on 20-Year Horizon – Military (\$47 M at 3/31/21)

Military target is more conservative (greater fixed income exposure) than PERS/TRS

Added alternative asset classes – private equity and real assets – in 2020

Plan is overfunded, but has a long tail to benefit distributions, stretching out decades.

For this exercise, the portfolio is optimized using broad US and non-US equity, broad US fixed income, and will included real assets and private equity

- Opportunistic is modeled as 60/40 exposure to public market stocks and bonds
- ARMB fixed income modeled as 95% broad market (BB Aggregate) and 5% cash (same as PERS/TRS)
- Real assets modeled using current target weights adopted for PERS/TRS
 - 37.5% Real estate
 - 10% Timber
 - 25% Farmland
 - 17.5% Private Infrastructure
 - 10% REITs

Range of alternative portfolios is anchored around Mix 3, which replicates the expected risk of the current target portfolio



Focus On 20-Year Horizon – Military

Compare Return and Risk for 2021 Capital Market Assumptions vs. 2020

- Target adopted in 2020 represents a portfolio expected to generate a nominal return of 6.1% over 20 years, or a real return of 4.13%
- Lower 2021 assumptions suggest a nominal return lower by 73 basis points, reflecting the reduction in expected bond returns and the larger allocation to fixed income in the Military portfolio
- Inflation assumption is 2.0%, down from 2.25% projected in 2020; as a result the expected real return is reduced by a smaller amount, down 45 basis points

	2021 Projection	2020 Projection
Broad US Equity	20	20
Global ex-US Equity	13	13
ARMB Fixed Income	46	46
Opportunistic	6	6
Real Assets	7	7
Private Equity	8	8
Totals	100.00	100.00
Projected Arithmetic Return	5.29%	6.02%
10-year Compound Return	4.96%	5.72%
Projected Standard Deviation	9.33%	9.33%
Projected Arithmetic Return	5.98%	6.38%
20-year Compound Return	5.68%	6.10%
Projected Standard Deviation	9.33%	9.33%
Real Return (2% inflation 2021,	3.68%	4.13%
2.25% in 2020)		
Equity	41%	41%
Fixed Income	46%	46%
Alts	15%	15%



Focus On 20-Year Horizon – Military Asset Mix Alternatives

Target Range of Mixes Centered Around Mix 3M – Diversified Mix With Same Risk as Target

								Public Market
		Military Target	Mix 1M	Mix 2M	Mix 3M	Mix 4M	Mix 5M	Proxy
	Broad US Equity	20	14	17	20	23	26	31
	Global ex-US Equity	13	9	11	13	15	17	21
	ARMB Fixed Income	46	56	51	46	41	36	48
	Opportunistic	6	6	6	6	6	6	0
	Real Assets	7	7	7	7	7	7	0
	Private Equity	8	8	8	8	8	8	0
	Totals	100.00	100.00	100.00	100.00	100.00	100.00	100.00
10-Year	Projected Arithmetic Return	5.29%	4.63%	4.96%	5.29%	5.61%	5.94%	5.12%
Projection	10-year Compound Return	4.96%	4.43%	4.69%	4.96%	5.21%	5.45%	4.78%
-	Projected Standard Deviation	9.33%	7.61%	8.46%	9.33%	10.22%	11.11%	9.33%
	·							
20-Year	Projected Arithmetic Return	5.98%	5.36%	5.67%	5.98%	6.29%	6.60%	5.84%
Projection	20-year Compound Return	5.68%	5.18%	5.43%	5.68%	5.91%	6.14%	5.53%
-	Projected Standard Deviation	9.33%	7.61%	8.46%	9.33%	10.22%	11.11%	9.33%
	Real Return (2% inflation)	3.68%	3.18%	3.43%	3.68%	3.91%	4.14%	3.53%
	Equity	41%	31%	36%	41%	46%	51%	52%
	Fixed Income	46%	56%	51%	46%	41%	36%	48%
	Alts	15%	15%	15%	15%	15%	15%	0%

Range of mixes varies by 5% increments to fixed income exposure; range of mixes centers around Mix 3, with the same risk as target

Current target has an expected return of 5.68% over 20 years

 Expected 20-year return using 2020 capital market assumptions was 6.10%; Mix 5M, with 10% less in fixed income, is expected to generate a nominal return comparable to that of the 2020 projected return

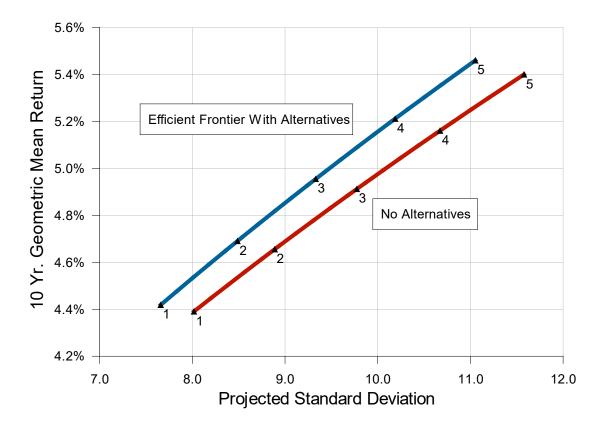
Opportunistic, real assets and private equity held to current target levels in alternative mixes

Mix 3 shows expected return for portfolio with same expected risk as the current target



Diversification Benefit to Alternatives

Efficient Frontier Comparison



Addition of private equity and real assets can provide a diversification benefit to the Military fund: greater return per unit of risk taken.

Consideration of cost, complexity and illiquidity are important. Long time horizon for benefit payments suggests long investment time horizon for the fund. Funded status may not compel the plan to seek higher return, but diversification of growth assets in a more conservative portfolio can still reap benefits to the fund.



Callan

Appendix

2021 Correlation Assumptions for Customized ARMB Asset Class Set

Correlation Matrix	Broad US	Large	SMID	Glb ex US	Int'l	Emerge	Dom Fix	ARMB Fix	Орр	Priv Cred	Priv Eq	Real A	RE	Timber	Farm	Infra	REITs	HF	Cash	CPI
Broad US Equity	1.000																			
Large Cap US Equity	0.997	1.000																		
Small/Mid Cap US Equity	0.931	0.900	1.000																	
Global ex-US Equity	0.817	0.807	0.796	1.000																
Developed ex-US Equity	0.781	0.770	0.770	0.980	1.000															
Emerging Market Equity	0.796	0.790	0.760	0.931	0.840	1.000														
Core US Fixed	-0.104	-0.099	-0.120	-0.123	-0.106	-0.140	1.000													
ARMB Fixed Income	-0.105	-0.100	-0.121	-0.124	-0.107	-0.141	1.000	1.000												
Opportunistic	0.986	0.990	0.887	0.793	0.758	0.773	0.042	0.042	1.000											
Private Credit	0.735	0.730	0.700	0.720	0.695	0.690	-0.060	-0.061	0.724	1.000										
Core Real Estate	0.708	0.705	0.663	0.674	0.660	0.629	-0.035	-0.035	0.703	0.560	1.000									
Timber	0.699	0.695	0.660	0.663	0.640	0.635	-0.020	-0.020	0.695	0.540	0.640	1.000								
Farmland	0.705	0.700	0.670	0.654	0.640	0.610	-0.100	-0.101	0.689	0.520	0.590	0.600	1.000							
Private Infrastructure	0.722	0.720	0.670	0.694	0.680	0.645	0.010	0.009	0.724	0.520	0.760	0.630	0.600	1.000						
US REITs	0.803	0.790	0.795	0.787	0.765	0.745	-0.110	-0.110	0.778	0.620	0.695	0.620	0.630	0.630	1.000					
Real Assets	0.845	0.839	0.800	0.804	0.785	0.753	-0.061	-0.061	0.834	0.643	0.914	0.774	0.818	0.858	0.821	1.000				
Hedge Funds	0.783	0.780	0.734	0.762	0.735	0.730	0.142	0.141	0.803	0.610	0.520	0.530	0.540	0.474	0.620	0.622	1.000			
Private Equity	0.803	0.798	0.760	0.783	0.760	0.743	-0.190	-0.190	0.774	0.680	0.600	0.600	0.600	0.620	0.750	0.730	0.602	1.000		
Cash Equivalents	-0.064	-0.060	-0.080	-0.104	-0.100	-0.100	0.150	0.162	-0.039	-0.060	0.000	-0.010	-0.100	-0.070	-0.050	-0.052	-0.040	0.000	1.000	
Inflation	-0.013	-0.020	0.020	0.011	0.000	0.030	-0.250	-0.249	-0.056	0.060	0.100	0.020	0.010	0.055	0.120	0.076	0.150	0.060	0.050	1.000



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ALASKA RETIREMENT MANAGEMENT BOARD

Fiscal Year 2022 Asset Allocation Discussion

June 2021

Zachary A Hanna, CFA Chief Investment Officer

Key Board Decisions

Determine Investment Objective • Fund's Purpose

- Fund's Purpose
- Governance who makes which decisions?

Determine Asset Allocation

- Strategic
- Tactical

Oversee Implementation

- Manager Structure number and types of manager allocations.
- Manager Selection

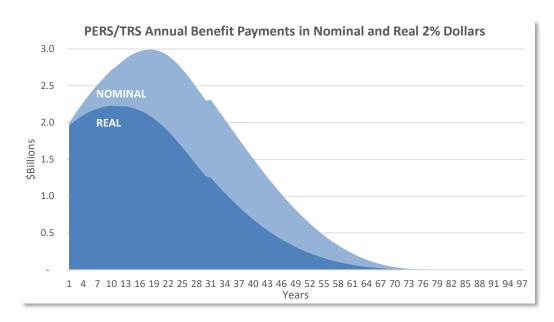
Monitor Results

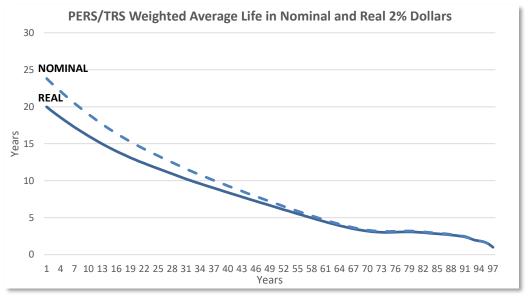
- Are the fund, asset classes and mandates performing as expected?
- Are they achieving objectives?

Paying Benefits When They are Due

- The PERS and TRS defined benefit systems are closed and mature but expected payments have not peaked and extend 97 years into the future.
- The systems are expected to make material payments greater than one billion dollars annually for at least three decades.

- The weighted average life of these payments is currently 20 years in inflation-adjusted terms.
- The weighted average life decays slowly and maintains a long time horizon of 10+ years for the next three decades.

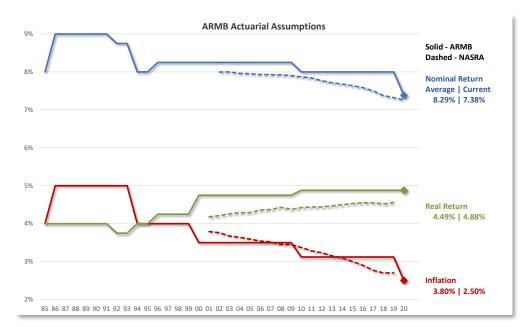


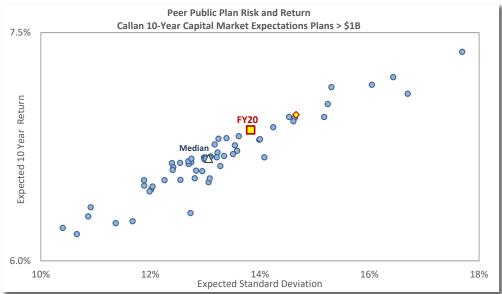


Investment Risk Posture

- The plans are expected to pay out \$115 billion in nominal payments and \$75 billion in inflation-adjusted payments over time.
- Investment returns and contributions need to bridge the gap between current assets and these payments.
- The ARMB has adopted a real return expectation of 4.88%.

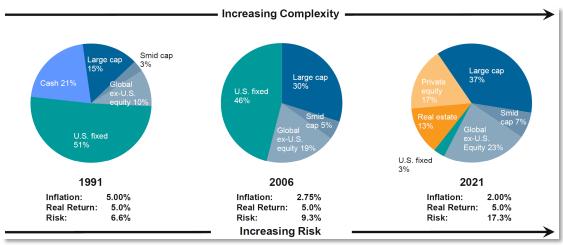
- Plan sponsor risk postures vary due to differing time horizons, asset/liability relationships, and other unique circumstances.
- The ability to bear risk is influenced by downside risk, prudent investor considerations, liquidity, and other factors.



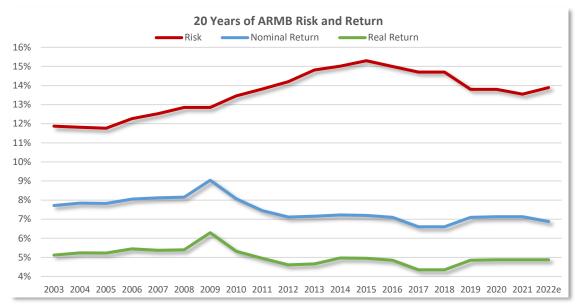


Rising Risk and Increasing Complexity

- Positioning a portfolio to achieve a 5% real return has required increasing levels of risk and complexity.
- Like most institutional investors, the ARMB's risk has generally risen over time, while real returns have remained relatively static.
- By moving to a 20-year time horizon in 2019, the ARMB better aligned assets and liabilities and moderated annual asset allocation changes.



Source: Callan LLC



PERS/TRS/Judicial Recommendation

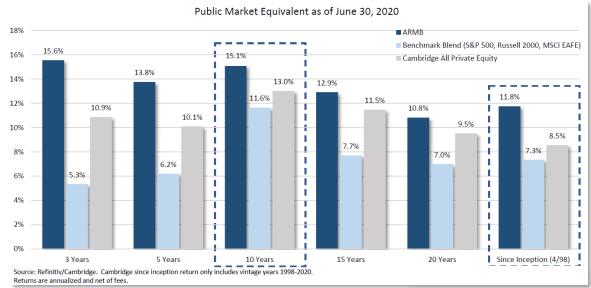
- Staff is recommending the "PE, RA 14" asset allocation, which increases private equity 2% and real assets 1% and reduces domestic equity 1%, international equity 1%, and fixed income 1%.
 - The risk increase is manageable.
 - The real return is equal to the actuarial assumption with upside from proven alternatives.
 - The liquidity profile is similar and the ARMB still has a long time horizon.

		Alternati	ve Targets				
			-				Public Marke
	Target	PE + 1%	PE, RA 14	Mix 1	Mix 2	Mix 3	Proxy
Broad US Equity	28	28	27	27	30	33	45
Global ex-US Equity	19	19	18	18	20	22	30
ARMB Fixed Income	22	21	21	24	19	14	25
Opportunistic	6	6	6	6	6	6	0
Real Assets	13	13	14	13	13	13	0
Private Equity	12	13	14	12	12	12	0
Totals	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Projected Arithmetic Return	6.90%	7.00%	7.04%	6.74%	7.06%	7.39%	6.65%
10-year Compound Return	6.15%	6.22%	6.25%	6.04%	6.26%	6.47%	5.89%
Projected Standard Deviation	13.56%	13.81%	13.89%	13.11%	14.02%	14.94%	13.56%
Projected Arithmetic Return	7.50%	7.59%	7.63%	7.35%	7.66%	7.97%	7.29%
20-year Compound Return	6.78%	6.84%	6.88%	6.68%	6.88%	7.07%	6.56%
Projected Standard Deviation	13.56%	13.81%	13.89%	13.11%	14.02%	14.94%	13.56%
Real Return (2% inflation)	4.78%	4.84%	4.88%	4.68%	4.88%	5.07%	4.56%
Equity	59%	60%	60%	57%	62%	67%	75%
Fixed Income	22%	21%	21%	24%	19%	14%	25%
Alts	25%	26%	28%	25%	25%	25%	0%

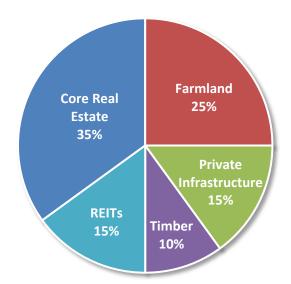
Source: Callan LLC

Additional Return Through Alternatives

- Private equity increased 2%, public equity decreased 2%:
 - ARMB's private equity returns are strong, having outperformed public markets by well over 200 bps for all time periods.
 - Private equity has become more efficient, but staff is comfortable that the program will continue to outperform due to a disciplined approach and access to high quality managers.
- Real assets increased 1%, fixed income decreased 1%:
 - The ARMB has a well-diversified real assets program.
 - The program is expected to provide the ARMB with inflation protection, diversification, and strong returns with a high cashflow component.



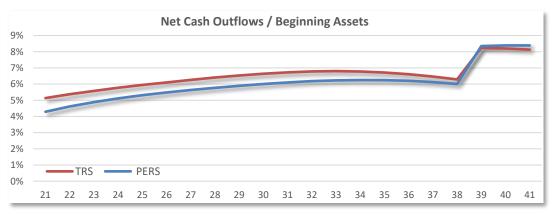
Source: Staff 2020 Private Equity Plan

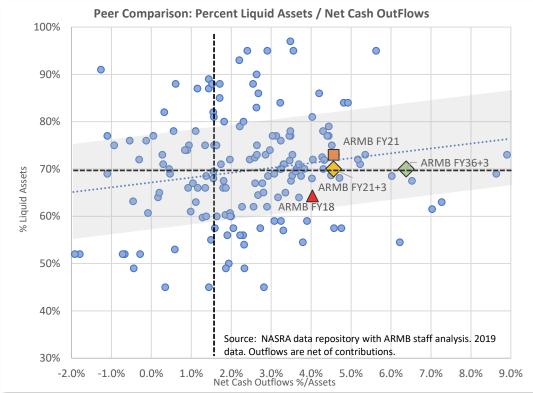


■ PERS/TRS net cash outflows will increase over time, but the increase is expected to be relatively modest for the next 15+ years.

- The ARMB's portfolio is much more liquid than it was 3 years ago even with the proposed changes.
- The current level of liquid assets should be sufficient for medium-term plan needs.
- Liquidity plays two important roles:
 - Meeting fund outflows
 - Maintaining the ARMB's risk posture through rebalancing

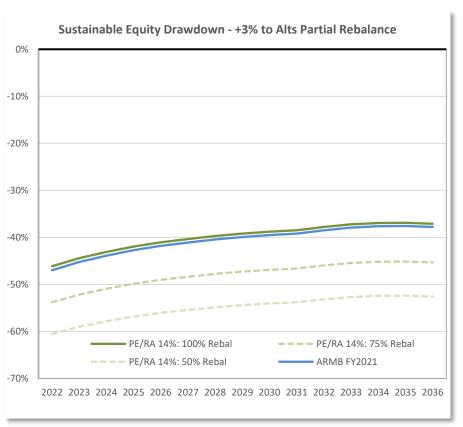
Liquidity

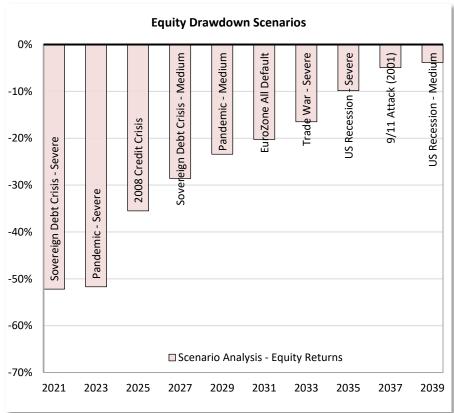




Liquidity, Market Stress, and Rebalancing

- The proposed asset allocation reduces the primary source of rebalancing funds, fixed income, by 1%,
- Since it also reduces public equity by 2%, the ability to rebalance in periods of equity market stress is largely unchanged.





Source: Staff and truView Risk Analytics

National Guard and Naval Recommendation

- This \$47 million system has relatively fixed benefits.
- The system is overfunded but has a long time horizon for benefit payments.
- Staff is recommending Mix 3M, which maintains the same risk posture as last year.

	Military Target	Mix 1M	Mix 2M	Mix 3M	Mix 4M	Mix 5M	Public Market Proxy
Broad US Equity	20	14	17	20	23	26	31
Global ex-US Equity	13	9	11	13	15	17	21
ARMB Fixed Income	46	56	51	46	41	36	48
Opportunistic	6	6	6	6	6	6	0
Real Assets	7	7	7	7	7	7	0
Private Equity	8	8	8	8	8	8	0
Totals	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Projected Arithmetic Return	5.29%	4.63%	4.96%	5.29%	5.61%	5.94%	5.12%
10-year Compound Return	4.96%	4.43%	4.69%	4.96%	5.21%	5.45%	4.78%
Projected Standard Deviation	9.33%	7.61%	8.46%	9.33%	10.22%	11.11%	9.33%
Projected Arithmetic Return	5.98%	5.36%	5.67%	5.98%	6.29%	6.60%	5.84%
20-year Compound Return	5.68%	5.18%	5.43%	5.68%	5.91%	6.14%	5.53%
Projected Standard Deviation	9.33%	7.61%	8.46%	9.33%	10.22%	11.11%	9.33%
Real Return (2% inflation)	3.68%	3.18%	3.43%	3.68%	3.91%	4.14%	3.53%
Equity	41%	31%	36%	41%	46%	51%	52%
Fixed Income	46%	56%	51%	46%	41%	36%	48%
Alts	15%	15%	15%	15%	15%	15%	0%

Source: Callan LLC

Questions and Action Memos

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Asset Allocations –	ACTION:	X
	Resolutions 2021-01 and 2021-02	_	
DATE:	June 17-18, 2021	INFORMATION:	
		_	
		_	

BACKGROUND:

The Alaska Retirement Management Board (ARMB) sets and reviews the asset allocations on behalf of all plans over which it has fiduciary responsibility.

STATUS:

CIO Zachary Hanna and associates with Callan LLC (Callan), reviewed Callan's capital market assumptions and asset allocation modeling work to identify potential asset allocation mixes for the ARMB to consider for the upcoming fiscal year.

Staff recommends the following strategic asset allocations after considering current asset allocations and a range of optimal portfolios produced by Callan:

Resolution 2021-01

Public Employees' Retirement System Defined Benefit and Defined Contribution Plans Teachers' Retirement System Defined Benefit and Defined Contribution Plans Judicial Retirement System Defined Benefit Plans

Resolution 2021-02

Alaska National Guard and Naval Militia Retirement Systems

RECOMMENDATION:

The Alaska Retirement Management Board adopt Resolutions 2021-01 and 2021-02, approving the asset allocations for fiscal year 2022.

State of Alaska ALASKA RETIREMENT MANAGEMENT BOARD

Relating to Asset Allocation for the Funds of the Public Employees' Retirement System Defined Benefit and Defined Contribution Plans, Teachers' Retirement System Defined Benefit and Defined Contribution Plans, and Judicial Retirement System Defined Benefit Plans

Resolution 2021-01

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee of the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policies for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, the Board contracts with an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has reviewed the actuarial assumptions; and

WHEREAS, the Board has reviewed the asset allocation set forth in the study prepared by the external investment consulting firm of Callan Associates, Inc.; and

WHEREAS, a prudent, diversified portfolio reduces risk and volatility and considers short term and long term earnings requirements for the Funds; and

WHEREAS, the Board shall continue to review, evaluate and make appropriate adjustments to asset allocation for the retirement plans on a periodic basis;

NOW THEREFORE, BE IT RESOLVED BY THE ALASKA RETIREMENT MANAGEMENT BOARD that effective July 1, 2021, the following Policy Benchmark be established for the following funds:

(1) Public Employees' Retirement System

- Defined Benefit Plans
 - o Retirement Trust
 - o Retirement Health Care Trust
- Defined Contribution Plans
 - o Health Reimbursement Arrangement Plan Trust Fund
 - o Retiree Medical Plan
 - o Defined Benefit Occupational Death and Disability
 - Public Employees All Other
 - Peace Officers and Firefighters

(2) Teachers' Retirement System

- Defined Benefit Plans
 - o Retirement Trust
 - Retirement Health Care Trust
- Defined Contribution Plans
 - o Health Reimbursement Arrangement Plan Trust Fund
 - o Retiree Medical Plan
 - o Defined Benefit Occupational Death and Disability

(3) Judicial Retirement System

- Retirement Trust
- Retirement Health Care Trust

PERS/TRS/Judicial

FY2022 Target Asset Allocation

Asset Class	Allocation	Range
Broad Domestic Equity	27%	± 6%
Global Equity Ex-US	18%	± 4%
Fixed Income	21%	± 10%
Opportunistic	6%	± 4%
Real Assets	14%	± 7%
Private Equity	14%	± 6%
Total	100%	
Projected 20 Year Geometric Return	6.88%	
Projected 20 Year Real Return	4.88%	
Projected Standard Deviation	13.89%	

Policy Benchmarks

Asset Class	Benchmark
Broad Domestic Equity	Russell 3000
Global Equity Ex-US	MSCI ACWI Ex-US IMI Net
Fixed Income	95% BB US Aggregate
	5% 3-Month Treasury Bill
Opportunistic	60% MSCI ACWI IMI Net
	40% BB US Aggregate
Real Assets	35% NFI-ODCE
	15% FTSE-NAREIT
	25% NCREIF Farmland
	10% NCREIF Timberland
	15% CPI+4%
Private Equity	1/3 S&P 500
	1/3 Russell 2000
	1/3 MSCI EAFE Net

This resolution repeals and replaces Resolution 2020-04.

DATED at Anchorage, Alaska this 18th day of June, 2021.

Chair

ATTEST: Dayle Harbe

Secretary

State of Alaska

ALASKA RETIREMENT MANAGEMENT BOARD

Relating to Asset Allocation

For the Alaska National Guard and Naval Militia Retirement Systems

Resolution 2021-02

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee of the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policy for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, the Board contracts with an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has reviewed the actuarial assumptions for the Alaska National Guard and Naval Militia Retirement Systems; and

WHEREAS, the Board has reviewed the asset allocation set forth in the study prepared by the external investment consulting firm of Callan Associates, Inc.; and

WHEREAS, a prudent, diversified portfolio reduces risk and volatility and considers short term and long term earnings requirements for the Funds; and

WHEREAS, the Board shall continue to review, evaluate and make appropriate adjustments to asset allocation for the retirement plans on a periodic basis;

NOW THEREFORE, BE IT RESOLVED BY THE ALASKA RETIREMENT MANAGEMENT BOARD that the following asset allocation be established for the Alaska National Guard & Naval Militia Retirement System, effective July 1, 2021:

Alaska National Guard and Naval Militia Retirement Systems

FY2022 Target Asset Allocation

Asset Class	Allocation	Range
Broad Domestic Equity	20%	± 6%
Global Equity Ex-US	13%	± 4%
Fixed Income	46%	± 10%
Opportunistic	6%	± 4%
Real Assets	7%	+ 4%
Private Equity	8%	± 4%
Total	100%	
Projected 20 Year Geometric Return	5.68%	
Projected Standard Deviation	9.33%	

Policy Benchmarks

Asset Class	Benchmark
Broad Domestic Equity	Russell 3000
Global Equity Ex-US	MSCI ACWI Ex-US IMI Net
Fixed Income	95% BB US Aggregate
	5% 3-Month Treasury Bill
Opportunistic	60% MSCI ACWI IMI Net
	40% BB US Aggregate
Real Assets	35% NFI-ODCE
	15% FTSE-NAREIT
	25% NCREIF Farmland
	10% NCREIF Timberland
	15% CPI+4%
Private Equity	1/3 S&P 500
	1/3 Russell 2000
	1/3 MSCI EAFE Net

This resolution repeals and replaces Resolution 2020-05.

DATED at Anchorage, Alaska this 18th day of June, 2021.

Chair

ATTEST: Dayle Harbe

Secretary

Alaska Retirement Management Board

Actuarial Review of Pension and Postemployment Healthcare Plans for PERS and TRS

Actuarial Review of the Public employees' Tier IV and Teachers' Tier III Defined Contribution Retirement Plan - for Occupational Death and Disability and Retiree Medical Benefits

February 24, 2021





February 24, 2021

Mr. Zach Hanna
Chief Investment Officer
Department of Revenue, Treasury Division
Alaska Retirement Management Board
P.O. Box 110405
Juneau, AK 99811-0405

Subject: Actuarial Review of June 30, 2020 valuations for the State of Alaska Public Employees'

Retirement System Defined Benefit Retirement Plan (PERS DB) and Teachers' Retirement

System Defined Benefit Retirement Plan (TRS DB)

Actuarial Review of June 30, 2020 valuations for the State of Alaska Public Employees' Retirement System Defined Contribution Retirement Plan (PERS DCR) and Teachers'

Retirement System Defined Contribution Retirement Plan (TRS DCR)

Dear Zach:

We have performed an actuarial review of the June 30, 2020 Actuarial Valuations for PERS DB, TRS DB, PERS DCR, and TRS DCR.

This report includes a review of:

- Pension Assumptions and Benefits
- Occupational Death and Disability Assumptions and Benefits
- Health Care Cost Assumptions
- Actuarial Valuation Methods and Procedures
- Contribution Rate Determination
- Actuarial Valuation Report
- Potential Areas for Future Review

A major part of the review is a thorough analysis of the test lives provided by Buck. The report includes exhibits that summarize the detailed analysis of these sample test cases, as well as a comparison of the results between Buck and GRS. We wish to thank the staff of the State of Alaska Treasury Division and Buck, without whose willing cooperation this review could not have been completed.

Sincerely,

Gabriel, Roeder, Smith & Company

Paul Wood, ASA, FCA, MAAA

Consultant

Bill Detweiler, ASA, FCA, MAAA

Consultant

cc: Ms. Pamela Leary Ms. Alysia Jones

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SECTION 1

EXECUTIVE SUMMARY

Executive Summary

Gabriel, Roeder, Smith & Co. was engaged by the Alaska Retirement Management Board (ARMB) to review the June 30, 2020 Actuarial Valuation of the State of Alaska Public Employees' Retirement System (PERS) and Teachers' Retirement System (TRS) including both the Defined Benefit Plans and the Defined Contribution Plans.

This report presents our findings in the following areas:

- General Approach
- Review of Assumptions
- Review of Actuarial Valuation Methods and Procedures (including the test lives review)
- Review of Contribution Rate Determination
- Review of Actuarial Valuation Report
- Potential Areas for Future Review
- Summary and Conclusions

In general, we found that the Buck's actuarial results and reports were reasonable and find the assumptions consistent with generally accepted actuarial practice

Monthly conference calls conducted between Buck and GRS were made this year and contributed greatly to resolving issues more quickly and thoroughly. Those issues, even if resolved, are highlighted in this report.

KEY FINDINGS FROM THE AUDIT OF THE JUNE 30, 2020 VALUATIONS

- We recommend Buck continue to carefully monitor the newly adopted assumptions going forward to determine if they are working as intended.
- We recommend Buck continues to track the medical claims experience closely, particularly any further impact of the drug costs associated with the new vendor and any further impact from COVID-19 experience.
- We recommend Buck review with the Board whether to implement a new entrant/rehire assumption in the DCR plan.
- We recommend Buck continue to disclose the nature and impact of all programming changes included in the valuation.
- We recommend Buck generate a new gain/loss item that tracks the experience of the EGWP savings assumption.
- We recommend that Buck detail the risk associated with assuming the EGWP subsidies will
 continue in perpetuity, especially if EGWP subsidies wear away over time.
- We recommend that Buck implement the changes to their valuation methods as detailed in Section 6 of this report.
- We recommend Buck make some small modifications to their valuation reports to improve communication and disclosures.



BUCK'S IMPLEMENTATION OF RECOMMENDATIONS FROM PRIOR REVIEW REPORT

As part of last year's actuarial review, we made several recommendations that were implemented by Buck in the June 30, 2020 valuations. These recommendations included the following:

- We recommend the retiree health care plan assumption of a member cost-sharing offset of 0.2% be removed.
- Changes to their valuation methods as detailed below.
 - Pre and Post Commencement Mortality Rates Buck's valuation reports currently state that different mortality rates are being applied pre and post 'termination', but we found that they are actually being applied pre and post 'commencement' or 'retirement'. This also creates some inconsistency with how mortality rates are being applied for members who have benefit, but not their Alaska COLA (which are any tier 2 and tier 3 members under age 65 who have commenced their retirement benefit). We recommend Buck apply the morality rates consistently between these different benefit pieces and that it is disclosed appropriately in the assumptions section of the reports.
 - Timing of PRPA for Disability The 75% PRPA assumption should be applied immediately to all members on disability, but Buck is currently not applying them immediately to occupational disability benefits in PERS or deferred disability benefits in TRS. We recommend Buck update their calculations so that the 75% PRPA assumptions is applied immediately to all members on disability.
 - Retiree Medical Participation Rates It appears that Buck is basing retiree medical
 participation rates on credited service, rather than eligibility service. For a select number
 of employees, these service amounts are different. We recommend Buck always base the
 retiree medical participation rates on the appropriate eligibility service.
- We recommend Buck make some small modifications to their valuation reports to improve communication and make them more consistent.

We appreciate Buck making these changes to the June 30, 2020 valuation.

SUMMARY OF TEST LIFE REVIEW

We have included as a part of this report a detailed test life results summary.

- We matched the present value of benefits closely in total on all testlives submitted. We have included exhibits in Sections 6 and 7 of the report, which summarize the differences in calculations by decrement for the test lives analyzed. Differences between actuarial firms will always occur due to system differences and other nuances in the calculations.
- We identified the following four findings related to the valuation. Two of them were clarified by Buck and should be disclosed appropriately in their reports. The other two, while may be viewed as immaterial, should, at the very least, be updated in future valuations, subject to Actuarial Committee discretion.
 - Timing of Alaska COLA for Disability
 - Retirement Benefit for PERS DB Peace Officer/Firefighter Occupational Disability
 - Rate Used in Valuation Not Matching Rate Disclosed in Report
 - Actuarial Assumptions for TRS Early Retirement Factors



SECTION 2

GENERAL APPROACH

General Approach

Gabriel, Roeder, Smith & Co. was charged with reviewing the actuarial assumptions of the pension and health care provisions of the actuarial valuations of PERS DB, TRS DB, PERS DCR, and TRS DCR.

We requested a number of items from Buck in order to perform the actuarial review and health cost assumption review:

- 1. In October and November of 2020, we received valuation data for pension and healthcare for both plans, we received the pension and healthcare test lives for PERS DB, TRS DB, PERS DCR and TRS DCR, and we received preliminary liabilities.
- 2. We received draft reports in January 2021.
- 3. Monthly conference calls between Buck and GRS occurred, with the agenda items including timing of deliverables and the discussion of audit matters.

In performing our review, we:

- 4. Reviewed actuarial assumptions We checked to see if they were consistent, comprehensive, and appeared reasonable.
- 5. Reviewed the actuarial valuation reports, as of June 30, 2020, for completeness and reviewed the financial determinations.
- 6. Reviewed, in detail, the sample members provided us This provided us with a perspective on the actuarial process utilized by Buck with respect to the plan and allowed us to review the valuation methods and procedures.
- 7. Reviewed the health cost assumptions and trend.

KEY ACTUARIAL CONCEPTS

An actuarial valuation is a detailed statistical simulation of the future operation of a retirement system using the set of actuarial assumptions adopted by the Board. It is designed to simulate all of the dynamics of such a system for each current system member including:

- 1. Earning future service and making contributions,
- 2. Receiving changes in compensation,
- 3. Leaving the system through job change, disablement, death, or retirement, and
- 4. Determination of and payment of benefits from the System.

This simulated dynamic is applied to each active member of the System. It results in a set of expected future benefit payments to that member. Bringing those expected payments to present value, at the assumed rate of investment return, produces the Present Value (PV) of future Benefits for that member. In like manner, a PV of future salaries is determined.

The PV of future benefits and the PV of future salaries for the entire System are the total of these values across all members. The remainder of the actuarial valuation process depends upon these building blocks.



Once the basic results are derived, an actuarial method is applied in order to develop information on contribution levels and funding status. An actuarial method splits the PV of future benefits into two components:

- 1. PV of Future Normal Costs, and
- 2. Actuarial Accrued Liability ("AAL").

The actuarial method in use by the State of Alaska is known as the Entry Age Normal (EAN) method. Under EAN, the Normal Cost for a member is that portion of the PV of the increase in the value of that member's benefit for service during the upcoming year. The AAL is the difference between the total PVB and the PV of all future normal costs.

For TRS DB and PERS DB, the PV of future benefits applies to the following benefits:

- Retirement benefits
- Withdrawal benefits
- Disability benefits
- Death benefits
- Return of contributions
- Medical benefits
- Indebtedness (from contributions which might be redeposited)

For TRS DCR and PERS DCR plans, the actuarial present value of future benefits applies to the following benefits:

- Occupational Disability benefits
- Occupational Death benefits
- Retiree Medical benefits

The medical benefits are based on potential future health care benefits, while the others are a type of post-employment income replacement benefit, based on salary. For the medical benefits, estimates must be made of the future health care costs. This is done by determining current per capita health care claim costs by age of retiree, and projecting them into the future based on anticipated future health care inflation.



SECTION 3

REVIEW OF GAINS AND LOSSES

Review of Gains and Losses

As a part of the annual audit, we take a historical look at the gains and losses on the accrued liability. Gains and losses may measure "how closely" experience matches the actuarial assumption. Recurring gains or losses may indicate an assumption that is not meeting the actual experience for this population. In the tables below, we detail the historical gains and losses for each plan. In addition, we have shown the gain or loss as a percent of the beginning of year (BOY) accrued liability (AL).

TABLE 1-PERS DB PENSION GAINS AND (LOSSES) BY SOURCE (000'S)

<u>Source</u>	<u>2020</u> <u>Valuation</u>	2019 Valuation	2018 Valuation	2017 Valuation	<u>2016</u> Valuation
Retirement	\$ (1,285)	\$ (3,126)	\$ (10,403)	\$ 1,448	\$ (1,035)
Termination	(4,857)	6,714	(5,131)	(9,254)	(8,713)
Mortality	(6,421)	12,459	39,631	3,856	23,872
Disability	(901)	(1,435)	(3,631)	(1,612)	(687)
Rehires	8,418	(13,297)	7,141	(6,403)	(31,814)
Other	5,835	(8,534)	(7,923)	25,341	520
Salary	11,228	(59,955)	97,200	121,046	69,532
COLA and PRPA	78,795	(8,371)	108,227	146,017	132,576
Total G/L	\$ 90,812	\$ (75,545)	\$ 225,111	\$ 280,439	\$ 184,251
Total AL at BOY	\$ 15,039,180	\$ 14,606,033	\$ 13,832,130	\$ 13,633,033	\$ 13,337,929
G/L as a % of AL	0.60%	-0.52%	1.63%	2.06%	1.38%

Note: 2016-2018 gains and losses are prior to the implementation of new assumptions.

The \$91 million gain in the most recent valuation is predominantly made up of positive experience on the postretirement pension adjustments (PRPA). The adjustments that occurred in 2020 were less than those assumed in the actuarial valuation. Also, the increase in salaries was less than assumed, and the increase in liabilities for rehires was less than assumed.

After a number of years with salary gains, the salary increase assumptions were lowered in the most recent experience study. There have now been two years of experience under the newly adopted assumptions and we have seen one year of gains and one year of losses. This assumption should be carefully monitored going forward to make sure the new salary increase assumptions were correctly lowered.

The rehired category generated a gain. The liabilities for rehires were less than what was assumed with the normal cost rehire load. This was also an assumption that was updated with the most recent experience study and it should be monitored going to forward to see if it should have been set higher.

All of the other gains and losses will also need to be monitored over the next few valuations to determine if the assumption changes worked as intended.



TABLE 2-PERS DB HEALTHCARE GAINS AND (LOSSES) BY SOURCE (000'S)

Source		<u>2020</u>		<u>2019</u>		<u>2018</u>		<u>2017</u>		2016
<u>source</u>	<u>V</u>	aluation_	<u>V</u>	<u>aluation</u>	<u>v</u>	<u>aluation</u>	<u>v</u>	<u>aluation</u>	<u>v</u>	<u>aluation</u>
Retirement	\$	4,857	\$	1,098	\$	22,262	\$	23,360	\$	(7,873)
Termination		(8,049)		(946)		(6,746)		(12,648)		(13,620)
Mortality		156		2,976		4,794		22,472		20,654
Disability		867		(981)		288		(1,155)		(1,966)
Rehires		15,996		10,708		5,948		1,089		(8,617)
Other		1,735		95,602		(19,667)		80,508		21,567
Medical Claims		278,796		642,081		412,243		830,620		(198,836)
Modified Part B Assumption		6,345		6,164		235,258		N/A		N/A
Dependent Coverage Election		23,400		18,580		69,614		N/A		N/A
COVID-19		25,856		-		-		=		-
Methodology		-		-		-		(976,619)		-
Total	\$	349,959	\$	775,282	\$	723,994	\$	(32,373)	\$	(188,691)
Total AL at BOY	\$	7,151,694	\$	7,658,104	\$	8,049,265	\$	7,736,457	\$	7,310,734
G/L as a % of AL		4.89%		10.12%		8.99%		-0.42%		-2.58%

Note: 2016-2018 gains and losses are prior to the implementation of new assumptions.

Overall, there was a \$350 million gain on the PERS DB Healthcare results. This is mostly due to positive experience on the medical claims. This is now the fourth year in a row there have been significant medical claims gains. The large gains last year and this year are mostly comprised of increased rebates experienced after changing vendors on January 1, 2019. This will be discussed further in the next section.

This year there were also gains attributable to COVID-19 experience as certain medical procedures, such as elective surgeries, were deferred by many participants. Buck attempted to quantify these gains, which will also be discussed in the next section.

Based on our recommendation as part of our prior audits, Buck included separate gain loss items to detail gains and losses attributable to both the modified Part B assumption and dependent coverage elections. Similar to the past couple years, there are again gains this year that indicate fewer members are eligible for Part B than assumed and fewer dependents are electing coverage than assumed. This is beginning to become a trend and will continue to be monitored over the next couple years to see if these assumptions should be modified.



TABLE 3-TRS DB PENSION GAINS AND (LOSSES) BY SOURCE (000'S)

Source	<u>2020</u>			<u>2019</u>		<u>2018</u>		<u>2017</u>		<u>2016</u>	
<u>Source</u>	<u>V</u>	<u>aluation</u>	<u>V</u>	<u>aluation</u>	<u>V</u>	<u>'aluation</u>	<u>v</u>	<u>aluation</u>	<u>V</u>	<u>aluation</u>	
Retirement	\$	4,822	\$	4,611	\$	6,125	\$	9,201	\$	7,046	
Termination		(8,327)		(4,692)		(11,283)		(11,770)		(9,687)	
Mortality		(11,161)		(6,628)		1,634		(282)		(5,612)	
Disability		(337)		(1,732)		(543)		(1,010)		(369)	
Rehires		(691)		2,148		3,114		5,142		(8,470)	
Other		(3,258)		(3,295)		3,790		(10,367)		(34,154)	
Salary		6,443		7,272		41,455		37,590		32,576	
COLA and PRPA		43,389		(5,231)		80,819		92,877		84,426	
Total	\$	30,880	\$	(7,547)	\$	125,111	\$	121,381	\$	65,756	
Total Al at BOY	\$	7,388,020	\$	7,276,290	\$	7,217,525	\$	7,159,788	\$	7,051,724	
G/L as a % of AL		0.42%		-0.10%		1.73%		1.70%		0.93%	

Note: 2016-2018 gains and losses are prior to the implementation of new assumptions.

TRS DB also saw an overall gain, again predominantly made up of positive experience on the PRPAs. There were also salary gains, termination losses, and mortality losses.

Again, as this is only the second year of experience under the newly adopted assumptions, these gains and losses will be monitored over the next few valuations to determine if the assumption changes worked as intended.

TABLE 4-TRS DB HEALTHCARE GAINS AND (LOSSES) BY SOURCE (000'S)

Source		2020		<u>2019</u>		<u>2018</u>		2017		2016
<u>Source</u>	<u>V</u>	aluation_	<u>v</u>	<u>aluation</u>	<u>V</u>	<u>aluation</u>	<u>v</u>	<u>'aluation</u>	<u>V</u>	<u>aluation</u>
Retirement	\$	2,189	\$	3,344	\$	13,627	\$	17,174	\$	1,691
Termination		(1,260)		(2,555)		(2,501)		(7,543)		(3,040)
Mortality		(2,276)		(3,198)		(812)		7,778		5,240
Disability		31		(19)		259		(666)		466
Rehires		5,506		1,710		(146)		(1,755)		(584)
Other		(4,433)		20,341		(6,683)		42,231		5,597
Medical Claims		96,760		225,987		146,354		257,626		24,266
Modified Part B Assumption		2,089		1,594		23,321		N/A		N/A
Dependent Coverage Election		7,435		15,195		18,765		N/A		N/A
COVID-19		17,345		-		-		-		-
Methodology		-		-		-		(378,830)		-
Total	\$	123,386	\$	262,399	\$	192,184	\$	(63,985)	\$	33,636
Total AL at BOY	\$	2,518,644	\$	2,684,150	\$	2,927,093	\$	2,747,836	\$	2,677,393
G/L as a % of AL		4.90%		9.78%		6.57%		-2.33%		1.26%

Note: 2016-2018 gains and losses are prior to the implementation of new assumptions.

The TRS DB healthcare plans experienced the same gains attributable to medical claims experience and COVID-19 experience. The discussion on PERS DB applies to TRS DB as well.



TABLE 5-PERS DCR TOTAL GAINS AND (LOSSES) BY SOURCE (000'S)

<u>Source</u>		<u>2020</u>		<u>2019</u>		<u>2018</u>		<u>2017</u>		<u>2016</u>	
		<u>Valuation</u>		Valuation		<u>Valuation</u>		<u>Valuation</u>		<u>Valuation</u>	
Mortality	\$	2,018	\$	1,197	\$	1,566	\$	883	\$	955	
Termination		867		1,579		3,519		1,417		1,154	
Disability		2,850		1,696		1,955		2,228		1,715	
New Entrants		(1,440)		(1,593)		(1,748)		(1,825)		(1,695)	
Rehires		(3,363)		(2,671)		(2,795)		(1,393)		(1,054)	
Other Demographic Experience		1,433		2,481		1,249		1,465		(3,935)	
Salary Increases		(25)		(80)		40		131		24	
Trend Rates/Cadillac Tax*		(7,485)		1,233		(1,605)		(24,441)		-	
Medical Claims Costs		7,863		15,366		759		908		8,044	
Total	\$	2,718	\$	19,208	\$	2,940	\$	(20,627)	\$	5,208	
Total AL at BOY	\$	134,720	\$	126,311	\$	117,243	\$	77,052	\$	63,732	
G/L as a % of AL	2.02%		15.21%		2.51%		-26.77%		8.17%		

^{*}Trend rate gain/loss applicable to 2017 & 2020 and the Cadillac tax is applicable to 2018 & 2019. Note: 2016-2018 gains and losses are prior to the implementation of new assumptions.

The table above shows the combined gains and losses for the PERS DCR. Similar to the DB plans, there continues to be large gains coming from the medical claims costs. This year, there was also a large loss due to the elimination of the 0.2% annual trend rate assumption. This will be discussed further in the next section.

As expected, there continues to be losses to the plan due to the new entrants and rehired members. We recommend Buck review with the Board whether to implement an assumption in the DCR plans similar to the rehire assumption in the DB plans.

TABLE 6-PERS DCR HEALTHCARE ONLY GAINS AND (LOSSES) BY SOURCE (000'S)

<u>Source</u>		<u>2020</u>		<u>2019</u>		<u>2018</u>		<u>2017</u>		<u>2016</u>	
		<u>Valuation</u>		<u>Valuation</u>		<u>Valuation</u>		<u>Valuation</u>		<u>Valuation</u>	
Mortality	\$	243	\$	(387)	\$	57	\$	30	\$	(40)	
Termination		985		1,567		3,467		1,418		1,181	
Disability		354		317		264		228		158	
New Entrants		(1,301)		(1,476)		(1,587)		(1,666)		(1,593)	
Rehires		(3,327)		(2,630)		(2,763)		(1,354)		(1,029)	
Other Demographic Experience		860		2,401		1,380		1,116		(4,127)	
Salary Increases		-		-		-		-		-	
Trend Rates/Cadillac Tax*		(7,485)		1,233		(1,605)		(24,441)		-	
Medical Claims Costs		7,863		15,366		759		908		8,044	
Total	\$	(1,808)	\$	16,391	\$	(28)	\$	(23,761)	\$	2,594	
Total AL at BOY	\$	124,946	\$	118,598	\$	109,703	\$	70,289	\$	58,683	
G/L as a % of AL	-1.45%		13.82%		-0.03%		-33.80%		4.42%		

^{*}Trend rate gain/loss applicable to 2017 & 2020 and the Cadillac tax is applicable to 2018 & 2019. Note: 2016-2018 gains and losses are prior to the implementation of new assumptions.



The table above isolates the gains and losses on the PERS DCR retiree healthcare plan only. These numbers are very similar to the plan in total, showing that the majority of the gains and losses for DCR come from the healthcare plan.

TABLE 7-TRS DCR TOTAL GAINS AND (LOSSES) BY SOURCE (000'S)

Source	<u>2020</u>			<u>2019</u>		<u>2018</u>		<u>2017</u>		<u>2016</u>	
Jource		<u>Valuation</u>		<u>Valuation</u>		<u>Valuation</u>		<u>Valuation</u>		<u>Valuation</u>	
Mortality	\$	60	\$	123	\$	36	\$	41	\$	36	
Termination		740		1,921		865		1,433		1,309	
Disability		178		171		99		170		137	
New Entrants		(495)		(808)		(724)		(600)		(1,176)	
Rehires		(2,313)		(874)		(2,975)		(617)		-	
Other Demographic Experience		98		(31)		(49)		94		(968)	
Salary Increases		-		1		-		-		-	
Trend Rates/Cadillac Tax*		(2,153)		389		(375)		(7,948)		-	
Medical Claims Costs		2,162		4,135		290		303		2,768	
Total	\$	(1,723)	\$	5,027	\$	(2,833)	\$	(7,124)	\$	2,106	
Total AL at BOY	\$	33,221	\$	32,459	\$	33,707	\$	22,007	\$	19,797	
G/L as a % of AL	-5.19%		15.49%		-8.40%		-32.37%		10.64%		

^{*}Trend rate gain/loss applicable to 2017 & 2020 and the Cadillac tax is applicable to 2018 & 2019. Note: 2016-2018 gains and losses are prior to the implementation of new assumptions.

The table above shows the combined gains and losses for the TRS DCR. Similar to the DB plans, there are gains are coming from the medical claims cost. This year, there was also a large loss due to the elimination of the 0.2% annual trend rate assumption. This will be discussed further in the next section.

As expected, there continues to be losses to the plan due to the new entrants and rehired members. We recommend Buck review with the Board whether to implement an assumption in the DCR plans similar to the rehire assumption in the DB plans.



TABLE 8-TRS DCR HEALTHCARE ONLY GAINS AND (LOSSES) BY SOURCE

Source	<u>2020</u>		<u>2019</u>		<u>2018</u>		<u>2017</u>		<u>2016</u>	
<u> </u>	<u>Valuation</u>		<u>Valuation</u>		<u>Valuation</u>		<u>Valuation</u>		<u>Valuation</u>	
Mortality	\$	(50)	\$	15	\$	(37)	\$	(22)	\$	(22)
Termination		744		1,926		871		1,435		1,313
Disability		(21)		(20)		(108)		(21)		(22)
New Entrants		(495)		(600)		(724)		(600)		(1,176)
Rehires	(:	2,314)		(873)		(2,974)		(617)		-
Other Demographic Experience		89		(4)		(29)		94		(987)
Salary Increases		-		-		-		-		-
Trend Rates/Cadillac Tax*	(:	2,153)		389		(375)		(7,948)		-
Medical Claims Costs		2,162		4,135		290		303		2,768
Total	\$ (2,038)	\$	4,968	\$	(3,086)	\$	(7,376)	\$	1,874
Total AL at BOY	\$ 3	32,981	\$	32,429	\$	33,681	\$	21,988	\$	19,768
G/L as a % of AL	-6.18%		15.32%		-9.16%		-33.55%		9.48%	

^{*}Trend rate gain/loss applicable to 2017 & 2020 and the Cadillac tax is applicable to 2018 & 2019. Note: 2016-2018 gains and losses are prior to the implementation of new assumptions.

The table above isolates the gains and losses on the TRS DCR retiree healthcare plan only. These numbers are very similar to the plan in total, showing that the majority of the gains and losses for DCR come from the healthcare plan.

SUMMARY OF RECOMMENDATIONS RESULTING FROM A REVIEW OF GAINS AND LOSSES

Based on our review above, we recommend the following be considered by Buck:

- Continue to carefully monitor the most recently adopted assumptions going forward to determine if they are working as intended.
- Continue to track the medical claims experience closely, particularly any further impact of the drug costs associated with the new vendor.
- Continue to disclose the nature and impact of all programming changes included in the valuation.
- Discuss with the Board whether to include a new entrant/rehire assumption for the DCR plans.



SECTION 4

REVIEW OF ASSUMPTIONS

Review of Pension Assumptions

Buck released an experience study in 2018 and the Board approved a new assumption set to be used beginning with the actuarial valuation as of June 30, 2018.

Although this audit examines many assumptions and methods, not all of them are equal in terms of their ultimate impact on contribution rates. It is not the intention of this audit to imply that all proposed changes would have a similar impact on the liabilities. For example, the investment return assumption may be the greatest lever in influencing contribution rates. Thus, where options exist for spending time and resources studying assumptions, we recommend studying those with the largest impact first.

ECONOMIC ASSUMPTIONS

General

These assumptions simulate the impact of economic forces on the amounts and values of future benefits. Key economic assumptions are the assumed rate of investment return and assumed rates of future salary increase.

Economic assumptions are normally defined by an underlying inflation assumption. Buck has cited 2.50% as the inflation assumption. In recent years, long-term inflation forecasts have been declining and this assumption will need to be monitored. We do find the assumption to be reasonable at this time.

Investment Return Assumption

The nominal investment return assumption is 7.38%. The assumption is net of all investment expenses. The rate is no longer net of administrative expenses. Combined with the 2.50% inflation assumption, this yields a 4.88% real net rate of return. While we find this assumption to still be reasonable, it should be noted that many other large state pension plans are continuing to decrease their return expectations as capital market assumptions are coming in lower. This assumption will need to be very carefully analyzed during the next experience analysis.

Member Pay Increase Assumption

In actuarial models, assumed rates of pay increase are often constructed as the total of several components:

Base salary increases -- base pay increases that include price inflation and general "standard of living" or productivity increases.

An allowance for Merit, Promotion, and Longevity – This portion of the assumption is not related to inflation. In the context of a typical pay grid, pay levels are set out for various employment grades with step increases for longevity:

The base salary increase assumption reflects overall growth in the entire grid, and the Merit, Promotion, and Longevity pay increase assumption reflects movement of members through the grid, both step increases and promotional increases.



Base Salary Increase Assumption

The Base Salary Increase Assumption (also known as the wage inflation assumption) is 2.75%. The 2.75% is comprised of 2.50% for general inflation and 0.25% for productivity increases.

Merit, Promotion, and Longevity Pay Increase Assumption

As described above, the Merit, Promotion, and Longevity pay increase assumption represents pay increases due to movement through the pay grid. This is based on longevity and job performance. In most models, it is recognized that step increases and promotions are very rare late in careers. Thus, this allowance should trail away from relatively high levels for young or short service members to virtually nothing late in careers. We would expect that, as members approach retirement, this component would fade away.

The pay increase assumption will need to be monitored to ensure that the changes made as part of the experience study end the pattern of large pay increase gains.

We would also offer that the manner in which pay changes over time for teachers in comparison to public employees tends to differ. Since most teachers have a specific skill set, the approach to their compensation tends to follow a more consistent trend. Public Employees however (except for Peace officers and Firefighters) tend to represent a multitude of different skills – from a more generalized, labor intensive capacity (e.g., custodial) to more specialized training (ex. Accounting).

COLA and PRPA

We find these assumptions to be reasonable. The inflation rate is a component of investment return, salary increase and the PRPA, so it has a ripple effect throughout all the economic assumptions.

DEMOGRAPHIC ASSUMPTIONS

Healthy mortality during active service and after termination

The RP-2014 tables with MP 2017 generational improvement (and with the various credibility adjustments) are reasonable.

Disabled mortality

The RP 2014 disabled table with MP 2017 generational improvement (and with the various credibility adjustments) is reasonable.

Withdrawal from service before retirement (termination)

The rates look reasonable based on the data presented in the experience study report.

Retirement

The rates look reasonable based on the data presented in the experience study report.

Disability

The rates look reasonable based on the data presented in the experience study report.



Withdrawal of contributions at termination

The rates look reasonable based on the data presented in the experience study report.

Other Assumptions

Contribution rates are based on a percent of total DB and DCR payroll. The assumption used in the valuation is that payroll will grow at a rate of 2.75 percent per year. In 2020, the total payroll, based on the annualized earnings for the fiscal year ending on the valuation date, grew by about 1%. The following table 9 shows the payroll growth over the past ten years.

Table 9-Historical Payroll Growth									
Veen	DB Plans	DCR Plans	Combined						
<u>Year</u>	<u>Only</u>	<u>Only</u>	DB and DCR						
2020	-7%	8%	1%						
2019	-5%	9%	2%						
2018	-7%	8%	0%						
2017	-7%	7%	0%						
2016	-5%	10%	1%						
2015	-6%	12%	1%						
2014	-5%	14%	1%						
2013	-4%	17%	2%						
2012	-3%	20%	3%						
2011	-3%	25%	3%						

Payroll growth is significant because the unfunded accrued liability (UAL) is amortized as a level percentage of pay. That is the same as expecting all future amortization payments to grow at the same rate as total payroll. When payroll does not grow as assumed then the UAL is not going to be paid off as assumed. In order for the UAL to be paid off according to the current amortization schedule, payroll must grow at the assumed payroll growth rate. If payroll does not grow at that rate, as has been the case for the last eight years, there will be upward pressure on the contribution rate because contributions that are less than anticipated are flowing in the plan.

SUMMARY

With this only being the second year of experience under the new assumptions, it is too soon to ascertain their effectiveness, although we can start to monitor any developing trends. Based on the experience study data presented, the assumptions and methods are reasonable. We will continue to monitor the results to track the effectiveness of the assumptions with regards to valuing plan costs.



Review of Health Care Cost Assumptions

GENERAL

Change in Data

Data was received from a data warehouse, and in the 2020 valuation report Buck has provided a reconciliation of the data provided. Buck still must estimate the number of members with dual coverage and the dependent's Medicare status.

Table 10 below shows the distribution of these counts by coverage and then by Medicare status.

Table 10-Summary of Retiree Medical Data Received									
	<u>PE</u> l	<u>RS</u>	ΞI	<u>RS</u>	<u>Total</u>				
	Total for	<u>Total</u>	Total for	Total for	Total for	Total for			
	<u>2019</u>	for 2020	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>			
Retiree coverage only	21,145	21,341	7,885	7,963	29,030	29,304			
Retiree and spouse	28,004	28,477	8,330	8,361	36,334	36,838			
Retiree and children and other dependents	864	795	378	373	1,242	1,168			
Family	2,754	2,651	1,241	1,163	3,995	3,814			
Total by Coverage	52,767	53,264	17,834	17,860	70,601	71,124			
Pre-Medicare	20,914	19,653	5,682	5,292	26,596	24,945			
Medicare A & B	31,634	33,370	11,917	12,340	43,551	45,710			
Medicare part B only	219	241	235	228	454	469			
Total by Medicare Status	52,767	53,264	17,834	17,860	70,601	71,124			

On page 80 of the PERS DB valuation report, the total incurred claims are spread over the eligible population. For Fiscal Year 2020, the average enrollment for the pre-Medicare group is 19,354 and for the Medicare group is 44,965. The total average enrollment for fiscal 2020 is the sum of these two groups, or 64,319. The counts in the table above include deferred members. When these counts are adjusted for deferred members, it demonstrates the claims are being spread over the appropriate eligible group.

Claims Cost and Medicare Offset

We analyzed the trend in the per capita claim costs over the last 12 years. Table 11(a) below shows the per capita claim costs since 2009. Table 11(b) shows the change year over year. A change in per capita claim costs also includes changes due to changes in the population as well as the method changes that have been used to estimate the eligible population. Thus, it is important not to read these results as strictly changes in the cost of health care since so much of the change is due to the changes in the population counts. Table 11(c) summarizes the overall changes in claim costs and the impact on the valuation results.



Table 11(a)-PERS and TRS Age 65 Per Capitas for Fiscal Year Ending													
Medicare Status:	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Medical: Pre-Medicare	7,670	7,503	8,606	9,497	9,856	11,125	12,362	11,724	14,380	13,682	13,535	14,464	15,360
Medical: Medicare A&B only	1,296	1,336	1,563	1,551	1,628	1,726	1,657	1,461	1,707	1,485	1,468	1,534	1,618
Medical: Medicare B only	3,384	4,754	6,654	6,936	6,219	6,676	7,920	6,700	8,562	4,722	4,667	4,880	5,340
Rx - Medicare	2,379	2,419	2,600	2,799	2,736	2,621	2,624	2,753	3,320	3,706	3,764	3,501	3,340

Table 11(b)-PERS and TRS Health Care Cost Trend Year over Year Changes													
Medicare Status:	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	Avg.
Medical: Pre-Medicare	-2.2%	14.7%	10.4%	3.8%	12.9%	11.1%	-5.2%	22.7%	-4.9%	-1.1%	6.9%	6.2%	6.0%
Medical: Medicare A&B only	3.1%	17.0%	-0.8%	5.0%	6.0%	-4.0%	-11.8%	16.8%	-13.0%	-1.1%	4.5%	5.5%	1.9%
Medical: Medicare B only	40.5%	40.0%	4.2%	-10.3%	7.3%	18.6%	-15.4%	27.8%	-44.8%	-1.2%	4.6%	9.4%	3.9%
Rx - Medicare	1.7%	7.5%	7.7%	-2.3%	-4.2%	0.1%	4.9%	20.6%	11.6%	1.6%	-7.0%	-4.6%	2.9%

Table 11(c)-PERS and TRS Health Care Cost Trend Actual to Assumed								
Medicare Status:	20-21 Actual	19-20 Assumed	Gain/ Loss					
Medical: Pre-Medicare	6.2%	7.0%	Gain					
Medical: Medicare A&B only	5.5%	5.4%	Loss					
Medical: Medicare B only	9.4%	5.4%	Loss					
Rx - Medicare	-4.6%	8.0%	Gain					

While the per capita medical costs increased slightly more or less than assumed, leading to small gains and losses, the large decrease in per capita prescription drug (Rx) costs clearly sticks out and explains the majority of the very large gains seen in the previous section. Last year, Buck provided supplemental information to GRS, showing that the decrease in the prescription drug costs was from a change in vendors that took place on January 1, 2019, and more specifically, a significant increase in prescription drug rebates. Since Buck averages the claims experience over the prior two years to calculate the per capita costs, we expected to see a similar decrease in prescription drug costs again this year, leading to more gains. We recommend Buck continues to track the medical claims experience closely, particularly any further impact of the drug costs associated with the new vendor.

Healthcare Trend Assumptions

The healthcare trend rates follow the Society of Actuaries' Healthcare Cost Trend model and the model has been populated with assumptions that are specific to the State of Alaska. The trend rates are reasonable.

EGWP assumption

We understand Alaska has moved to an EGWP effective January 1, 2019. Buck obtained a savings estimate from the EGWP vendor and used that as the basis for the valuation. We concur with that approach. Buck is assuming the EGWP subsidy will last in perpetuity. While this is not an unreasonable approach, we would recommend that Buck detail the risk associated with this assumption, especially if EGWP subsidies wear away over time. Furthermore, we recommend that Buck monitor the estimated savings each year and determine if an update to their model is necessary.

Medicare Part B Assumption

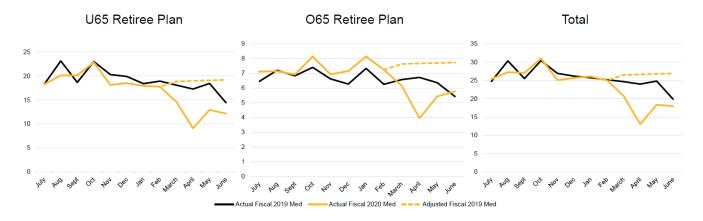
In 2018, Buck used a new methodology for determining the number of members eligible for Part B only, where 5% of pre-Medicare members are assumed to be eligible for Part B only. This change in assumption is reasonable, but created large gains in 2018 and we recommended that Buck explicitly track the



experience of this assumption and provide a gain/loss item in the report each year, which they have done since then. The gains have continued each year, so we recommend this assumption be carefully monitored going forward to see if the new methodology should be modified in the future.

COVID-19 Experience

The global pandemic caused by COVID-19 has impacted every aspect of life, and these plans are no exception. Like many other healthcare plans, the number of medical claims significantly dropped once the pandemic started in March of 2020, as people stayed home and generally put off any medical needs that didn't require immediate attention. The graphs below were put together by Buck and show medical claims in 2019 and 2020 for the under 65 and over 65 retiree health plans. As you can see with the solid lines, there is a noticeable drop in actual claims during the last few months of fiscal year 2020, compared to those same months in fiscal year 2019. This accounts for the COVID-19 experience gain shown in the prior section, as there was a much larger difference than usual between expected benefits paid and actual benefit paid. Buck normally includes this difference in the medical claims cost gain/loss amount in their report, but because it was much larger than usual this year, they separated the difference out and noted it as COVID-19 experience. We have a small report disclosure recommendation for these amounts that will be discussed further in Section 9 below.



Furthermore, the actual claims from the prior two years are normally used to set expectations of future claims, but as vaccinations are distributed and normal behavior returns when the pandemic ends, these decreases in claims are not expected to continue and do not represent future expectations. To account for this, Buck has adjusted the prior claims used in setting the claims cost assumption to instead be the dashed lines in the chart above. We agree that this is a reasonable and necessary adjustment to make.

It should also be noted that there was a small spike in prescription drug claims in March of 2020, as people were presumably stocking up on medications, but claims decreased back to expectations shortly thereafter and Buck felt the overall prescription drug experience during fiscal 2020 did not require any COVID-19 adjustments for setting future expectations of those claims.

There is still very much unknown about both the short and long-term impacts COVID-19 will have on the world. Buck will need to carefully analyze the claims experience in the next few years to determine if any further adjustments need to be made to account for behavior that may not be expected to continue in the future.



Other Assumptions

The following assumptions were used in the June 30, 2020, valuations for the DCR plans. Relative value refers to the value of the DCR benefits compared to those provided by the Defined Benefit retiree plan. Since the DCR plan does not yet have enough membership to create credible experience, they use the same claims costs developed under the DB plan, adjusted by the assumed relative value factors. These assumptions have changed slightly since the June 30, 2019 actuarial valuation.

Table 12-Relative Value between DB and DCR Health Plan								
DCR Health Plan as a percent of the DB Health Plan								
	June 30, 2020 June 30, 20							
Donofita	Voluntion	Maluation						
<u>Benefits</u>	<u>Valuation</u>	<u>Valuation</u>						
Pre-Medicare Medical	0.969	<u>valuation</u> 0.979						

As noted in prior audit reports, GRS had previously not been provided enough documentation on these relative value assumptions. We were very happy that this year Buck provided additional information on the plan provisions they run through their model to develop the actuarial value of the respective designs for the DB and DCR health plans. We ran this information through our model and matched closely, so we can now say that these relative value factors are reasonable.

The basis for these relative value factors rests with higher initial copays, deductibles, out of pocket limits and member cost sharing compared to the DB medical plan. As experience emerges we recommend the discount from the DB plan to the DCR plan continue to be tested to ensure this assumption is supporting the liabilities of the plan. When the DCR plans have enough credible claims experience, they should have their own claim cost assumptions set.

In the June 30, 2012, valuation, the assumption change on cost-sharing results was the single most important factor in the increase in the contribution requirements. This assumption is the 0.2% offset that was previously assumed to occur in each year. As noted in prior audit reports, GRS had not been provided enough documentation on this to conclude that this item was appropriate for developing the costs of the retiree medical plan.

Member cost-sharing offset was 0.2% in each future year, reflecting an intention to create cost equality in sharing future trend increases between retirees and the plan. We were concerned about this assumption since we were not aware of any plan changes that share the increase in trend that have occurred. In the absence of a stated policy or a practice, we recommended that this assumption be removed. We were very pleased to see that, after a thorough review, Buck agreed and did remove the assumption for the 2020 valuations. They provided GRS with a detailed explanation of their decision to remove this assumption and we agree with the conclusion.



SECTION 5

REVIEW OF ACTUARIAL VALUATION METHODS AND PROCEDURES

Review of Actuarial Valuation Methods and Procedures

I. Background

An actuarial valuation is a detailed statistical simulation of the future operation of a retirement system using the set of actuarial assumptions adopted by the Board.

The actuarial values generated from this process are based not only on these assumptions, but also on the additional assumptions built into each actuarial firm's pension valuation software.

Our scope for performing the review did not include a complete replication of the valuation results as determined by Buck at June 30, 2020. Rather, we reviewed a number of sample test lives from Buck in great detail, and made our determinations as to whether the methods and assumptions being employed were being done so properly. We also reviewed the report in order to examine the aggregate results and conclusions of this actuarial valuation.

Though this approach is not intended to meet the rigors of a full scale replication of results – it still serves as a strong indicator of the appropriateness of the assumptions and methods being used to value the liabilities and determine the costs for these plans.

II. Process:

Our review process can be summarized as follows:

Computation: Valuation Liabilities

We analyzed test cases to compare the Actuarial Liability under the EAN funding method for the test cases of the PERS and TRS Systems. As a starting point, we first replicate Buck test case liabilities by using their assumptions and methods to ensure that the computations were in sync with the descriptions listed in the valuation report.

When conducting an actuarial audit, and reviewing the testlives, we look at the projected benefits at each age for each decrement type. We also look at the component of the benefit (final average earnings and years of service). This is critical to understanding what the valuation system is actually valuing and making sure that the valuation is not "right for the wrong reasons", (meaning, errors could occur in two different directions making total liabilities approximate a correct value.)

We also review the construction of the commutation functions- the varying probabilities for each decrement and the discounting to the valuation date.

A more detailed analysis of the test lives we reviewed and our findings is shown in the next section.

Tying Test Lives to Total Liabilities

The basis of the audit is that the test lives reviewed tie directly to the liabilities being submitted in the valuation. As a result of learning of a discrepancy discovered a few years ago, we now request that Buck also supply a list of every member with their total liability. We check that the total



liability on the test life matches that from the larger group, and the larger group matches the total in the valuation report. That way we can be certain that the test life we review is directly tied to the final liabilities.

Actuarial Method:

Findings:

An actuarial cost method is a mathematical process for allocating the dollar amount of the total present value of plan benefits (PVB) between future normal costs and actuarial accrued liability (AAL). The retained actuary uses the Entry Age Normal actuarial cost method (EAN Method), characterized by:

- (1) Normal Cost the level percent of payroll contribution, paid from each participant's date of hire to date of retirement, which will accumulate enough assets at retirement to fund the participant's projected benefits from retirement to death.
- (2) Actuarial Accrued Liability the assets which would have accumulated to date had contributions been made at the level of the normal cost since the date of the first benefit accrual, if all actuarial assumptions had been exactly realized, and there had been no benefit changes.

The EAN Method is the most prevalent funding method in the public sector. It is appropriate for the public sector because it produces costs that remain stable as a percentage of payroll over time, resulting in intergenerational equity for taxpayers and budget predictability. The recent Public Fund Survey included 199 retirement systems (mostly statewide). Over 82% of the plans reported using the EAN Method. Therefore, the retained actuary's stated funding methods for TRS and PERS are certainly in line with national trends.

Application of Cost Method

In order to determine the normal cost as a level percentage of pay, the valuation must first determine the future compensation that each individual member is expected to receive over the course of their career (which is also the compensation used to generate contributions). The projection of the future compensation should be based on the salary that the participant is expected to receive according to the timing of the expected departures from active service (or, decrements).

Conclusion:

The level percent of pay method for both amortization of the unfunded accrued liability and the normal cost are both appropriate as a funding policy, considering that the payroll is not closed (as promulgated under SB 123.)





SAMPLE LIFE REVIEW — PERS DB AND TRS DB

Sample Life Review – PERS DB and TRS DB

BACKGROUND

We reviewed sample test cases used for the June 30, 2020 valuation draft reports. In order to perform the review, we requested a number of sample cases from Buck. We combined this with our understanding of the plan provisions and reviewed the liability values produced by Buck for these sample cases only.

Note that the active test lives analyzed are not necessarily exposed to all of the possible benefits under the plans (i.e. already beyond the eligibility period for certain benefits, or not eligible for particular benefits). Therefore, findings may occur for these other benefits in future audits depending on the set of test lives chosen for review at that time. However, the vast majority of the liability for each plan is due to the retirement benefits (included for all active test lives), and retirement-related withdrawal benefits (one active test life included per plan), so any future findings are also expected to be de minimus. Also, the impact for any one test life may not be representative of the impact on the total plan.

When employing Buck's methods and assumptions, we matched the present value of benefits in total closely for the test cases submitted under the Pension plans for PERS and TRS, and present value of retirement benefits under the PERS and TRS Retiree Health plan. In addition, we have analyzed the calculations of the ancillary benefits and have provided a summary of this detailed analysis at the end of this section. These exhibits provide a comparison of the calculations by decrement provided to us from Buck against our replication of those benefits as we interpret them from the plan provisions and assumptions.

In matching the present value of benefits, it is being determined that all benefits are being valued, and that the valuation of the liability for those benefits is consistent with the stated assumptions and methods.

FINDINGS

Generally speaking, the assumptions and methods were employed properly. The test lives chosen this year did have some unique characteristics, and we also fine-tuned some of the methodology for verifying the annuity factors used by Buck. As a result, we identified the following four minor findings related to the valuation of certain ancillary benefits:

- Timing of Alaska COLA for Disability The 10% Alaska COLA should be applied to all disabled members immediately, but it is not being applied until age 65 for members who have retired from disability. We recommend Buck update any calculations necessary so this COLA is applied immediately to all disabled members in both TRS and PERS.
- 2. Retirement Benefit for PERS DB Peace Officer/Firefighter Occupational Disability When PERS Peace Officer/Firefighter members in both the DB plan and DCR plan retire from occupational disability, the benefit should be increased by the same accumulative PRPA percentage that was applied to the disability benefit. Buck is currently only applying this increase to the occupational disability benefit for Peace Officer/Firefighters in the PERS DCR plan. We recommend Buck



update the occupational disability benefits in the PERS DB plan to also include this increase for Peace Officer/Firefighter members.

- **3.** Rate Used in Valuation Not Matching Rate Disclose in Report The ultimate rate of turnover for a male PERS DCR Peace Officer/Firefighter member at age 42 is shown to be 5.90% in the June 30, 2019 report, but a slightly different rate of 5.93% is being used in the calculations. We recommend not only clarifying this specific rate, but since we are unable to verify all rates with only a select number of sample lives, make sure all of the decrement rates shown in the reports are consistent with those being used in the calculations.
- **4. Actuarial Assumptions for TRS Early Retirement Factors** Early retirement factors (ERFs) are based on actuarial equivalence for the TRS DB plan, but it is not clear, based on Buck's valuation report, what actuarial assumptions are being used for the ERFS. We recommend Buck clarify the actuarial assumptions being used and disclose them appropriately in the TRS DB report.

We provided these findings to Buck. For item 3, Buck indicated that they have updated this specific rate in the June 30, 2020 PERS DCR valuation report to match what is being used in their calculations. For item 4, Buck clarified that these are older factors that have been grandfathered, since ERFs based on the more recently adopted actuarially assumptions produce lower benefit amounts. We still recommend Buck disclose the actuarial assumptions used for these ERFs in the appropriate section of the TRS DB report.

For the other two findings (items 1 and 2) Buck agreed they should be updated and estimated the impact of these changes as follows:

- Updating for item 1 would increase the June 30, 2020 actuarial accrued liability by approximately \$3.1 million for the PERS DB plan and \$0.3 million for the TRS DB plan.
- Updating for item 2 would decrease the June 30, 2020 actuarial accrued liability by approximately \$0.1 million for the PERS DB plan.

As shown, the impacts may be viewed as immaterial and, at the very least, be updated in future valuations, subject to Actuarial Committee discretion.



QUANTITATIVE RESULTS

When performing the replication, we were able to match the total present value of future benefits all test cases (active and inactive, PERS and TRS, pension and healthcare) closely. This would be considered as an overall match for purposes of the valuation.

Actuarial Review - June 30, 2020 Comparison of Present Value of Benefits

	nsion	GRS	Buck	% Diff
TRS	Active Test Case 1 - Tier 1	797,080	797,080	0.0%
TRS	Active Test Case 2 - Tier 2	354,744	354,771	0.0%
TRS	Active Test Case 3 - Tier 2	224,348	224,328	0.0%
PERS	Active Test Case 1 - P/F Tier 1	680,626	680,659	0.0%
PERS	Active Test Case 2 - Other Tier 2	758,624	758,627	0.0%
PERS	Active Test Case 3 - P/F Tier 3	882,600	882,583	0.0%
Inactive P		GRS	Buck	% Diff
TRS	TRS - Retiree - Female, Tier 1	764,636	764,636	0.0%
TRS	TRS - DV - Female, Tier 2	216,584	215,024	0.7%
TRS	TRS - Disabled Retiree - Male, Tier 2	298,517	310,573	-3.9%
PERS	PERS Peace Officer/Firefighter - Retiree	516,671	516,671	0.0%
PERS	PERS Peace Officer/Firefighter - Beneficiary	146,222	146,222	0.0%
PERS	PERS Peace Officer/Firefighter - DV	129,577	130,119	-0.4%
PERS	PERS Others - Retiree	93,209	93,209	0.0%
PERS	PERS Others - Beneficiary	61,401	61,401	0.0%
PERS	PERS Others - DV	87,991	87,991	0.0%
Active He		GRS	Buck	% Diff
TRS	Active Test Case 1 - Tier 1	264,232	201424	0 00/
		204,232	264,134	0.0%
TRS	Active Test Case 2 - Tier 2	156,902	153,220	2.4%
TRS PERS	Active Test Case 2 - Tier 2 Active Test Case 1 - P/F Tier 1	156,902 217,373	,	2.4% 0.0%
TRS PERS PERS	Active Test Case 2 - Tier 2 Active Test Case 1 - P/F Tier 1 Active Test Case 2 - Other Tier 2	156,902 217,373 279,830	153,220 217,367 278,641	2.4% 0.0% 0.4%
TRS PERS PERS PERS	Active Test Case 2 - Tier 2 Active Test Case 1 - P/F Tier 1 Active Test Case 2 - Other Tier 2 Active Test Case 3 - P/F Tier 3	156,902 217,373 279,830 302,609	153,220 217,367 278,641 302,269	2.4% 0.0% 0.4% 0.1%
TRS PERS PERS PERS	Active Test Case 2 - Tier 2 Active Test Case 1 - P/F Tier 1 Active Test Case 2 - Other Tier 2 Active Test Case 3 - P/F Tier 3	156,902 217,373 279,830	153,220 217,367 278,641	2.4% 0.0% 0.4%
TRS PERS PERS PERS Inactive H	Active Test Case 2 - Tier 2 Active Test Case 1 - P/F Tier 1 Active Test Case 2 - Other Tier 2 Active Test Case 3 - P/F Tier 3 Icalthcare TRS - Retiree - Female, Tier 1	156,902 217,373 279,830 302,609 GRS 91,040	153,220 217,367 278,641 302,269 Buck 91,027	2.4% 0.0% 0.4% 0.1% % Diff 0.0%
TRS PERS PERS PERS Inactive H TRS TRS	Active Test Case 2 - Tier 2 Active Test Case 1 - P/F Tier 1 Active Test Case 2 - Other Tier 2 Active Test Case 3 - P/F Tier 3 Icalthcare TRS - Retiree - Female, Tier 1 TRS - DV - Female, Tier 2	156,902 217,373 279,830 302,609 GRS 91,040 253,152	153,220 217,367 278,641 302,269 Buck	2.4% 0.0% 0.4% 0.1% % Diff 0.0% 0.1%
TRS PERS PERS PERS Inactive H	Active Test Case 2 - Tier 2 Active Test Case 1 - P/F Tier 1 Active Test Case 2 - Other Tier 2 Active Test Case 3 - P/F Tier 3 Icalthcare TRS - Retiree - Female, Tier 1 TRS - DV - Female, Tier 2 TRS - Disabled Retiree - Male, Tier 2	156,902 217,373 279,830 302,609 GRS 91,040	153,220 217,367 278,641 302,269 Buck 91,027	2.4% 0.0% 0.4% 0.1% % Diff 0.0%
TRS PERS PERS PERS Inactive H TRS TRS TRS PERS	Active Test Case 2 - Tier 2 Active Test Case 1 - P/F Tier 1 Active Test Case 2 - Other Tier 2 Active Test Case 3 - P/F Tier 3 Icalthcare TRS - Retiree - Female, Tier 1 TRS - DV - Female, Tier 2	156,902 217,373 279,830 302,609 GRS 91,040 253,152	153,220 217,367 278,641 302,269 Buck 91,027 252,880	2.4% 0.0% 0.4% 0.1% % Diff 0.0% 0.1%
TRS PERS PERS PERS Inactive H TRS TRS TRS PERS PERS	Active Test Case 2 - Tier 2 Active Test Case 1 - P/F Tier 1 Active Test Case 2 - Other Tier 2 Active Test Case 3 - P/F Tier 3 Icalthcare TRS - Retiree - Female, Tier 1 TRS - DV - Female, Tier 2 TRS - Disabled Retiree - Male, Tier 2 PERS Peace Officer/Firefighter - Retiree PERS Peace Officer/Firefighter - Beneficiary	156,902 217,373 279,830 302,609 GRS 91,040 253,152 96,845 75,774 83,401	153,220 217,367 278,641 302,269 Buck 91,027 252,880 96,872 75,766 83,391	2.4% 0.0% 0.4% 0.1% % Diff 0.0% 0.1% 0.0% 0.0%
TRS PERS PERS PERS Inactive F TRS TRS TRS PERS PERS PERS PERS	Active Test Case 2 - Tier 2 Active Test Case 1 - P/F Tier 1 Active Test Case 2 - Other Tier 2 Active Test Case 3 - P/F Tier 3 Jealthcare TRS - Retiree - Female, Tier 1 TRS - DV - Female, Tier 2 TRS - Disabled Retiree - Male, Tier 2 PERS Peace Officer/Firefighter - Retiree PERS Peace Officer/Firefighter - Beneficiary PERS Peace Officer/Firefighter - DV	156,902 217,373 279,830 302,609 GRS 91,040 253,152 96,845 75,774 83,401 243,669	153,220 217,367 278,641 302,269 Buck 91,027 252,880 96,872 75,766	2.4% 0.0% 0.4% 0.1% % Diff 0.0% 0.1% 0.0% 0.0% 1.7%
TRS PERS PERS Inactive H TRS TRS TRS PERS PERS PERS PERS PERS	Active Test Case 2 - Tier 2 Active Test Case 1 - P/F Tier 1 Active Test Case 2 - Other Tier 2 Active Test Case 3 - P/F Tier 3 Icalthcare TRS - Retiree - Female, Tier 1 TRS - DV - Female, Tier 2 TRS - Disabled Retiree - Male, Tier 2 PERS Peace Officer/Firefighter - Retiree PERS Peace Officer/Firefighter - Beneficiary PERS Peace Officer/Firefighter - DV PERS Others - Retiree	156,902 217,373 279,830 302,609 GRS 91,040 253,152 96,845 75,774 83,401 243,669 181,915	153,220 217,367 278,641 302,269 Buck 91,027 252,880 96,872 75,766 83,391 239,695 181,885	2.4% 0.0% 0.4% 0.1% % Diff 0.0% 0.1% 0.0% 1.7% 0.0%
TRS PERS PERS PERS Inactive F TRS TRS TRS PERS PERS PERS PERS	Active Test Case 2 - Tier 2 Active Test Case 1 - P/F Tier 1 Active Test Case 2 - Other Tier 2 Active Test Case 3 - P/F Tier 3 Jealthcare TRS - Retiree - Female, Tier 1 TRS - DV - Female, Tier 2 TRS - Disabled Retiree - Male, Tier 2 PERS Peace Officer/Firefighter - Retiree PERS Peace Officer/Firefighter - Beneficiary PERS Peace Officer/Firefighter - DV	156,902 217,373 279,830 302,609 GRS 91,040 253,152 96,845 75,774 83,401 243,669	153,220 217,367 278,641 302,269 Buck 91,027 252,880 96,872 75,766 83,391 239,695	2.4% 0.0% 0.4% 0.1% % Diff 0.0% 0.1% 0.0% 0.0% 1.7%



Note

Ancillary or non-retirement benefits such as death and disability tend to be low probability events (and hence low liability) and they also tend to have many "bells and whistles" which can be valued in different ways by different actuaries. When looking at the test life results, it may be most informative to review the decrement (retirement, termination, disability, death) totals rather than each particular segment of the decrement (married non-occupational death, etc.). For all ancillary benefits comprising less than 0.1% of the total PVB for that individual, we checked the amounts for reasonableness, but did not always replicate.



Actuarial Review of Pension and Health Plans - June 30, 2020

Comparison of Present Value of Benefits - **TRS Pension**Active Test Case 1 - Tier 1

Basic Data:	Current Age 53.88	Credited Service 29.80	Gender Female
Present Value of Benefits (PVB)	GRS Replicate	Buck	% Diff
Retirement:			
Main Retirement Benefit	753,694	753,693	0.0%
AK COLA	39,383	39,383	0.0%
Total Retirement PVB	793,077	793,076	0.0%
Withdrawal:			
Non Vested Term	-	-	0.0%
Vested Term	-	-	0.0%
Vested Term AK COLA	-	-	0.0%
Vested Term (take LS)	-	-	0.0%
Vested Term (death during deferral)	-	-	0.0%
Vested Term (death during deferral AK COLA)	-	-	0.0%
Vested Term (death, single)	-	-	0.0%
Total Withdrawal PVB	-	-	0.0%
Death:			
Non Vested NonOcc 1 <svc<5 dth<="" ls="" td=""><td>-</td><td>_</td><td>0.0%</td></svc<5>	-	_	0.0%
NonOcc Dth Marr	2,157	2,157	0.0%
NonOcc Dth Marr AK COLA	114	114	0.0%
NonOcc Single LS Dth	612	612	0.0%
Occ Dth Marr (Pre-NR Conversion Benefit)	-	-	0.0%
Occ Dth Marr (Post-NR Conversion Benefit)	1,064	1,064	0.0%
Occ Dth Marr AK COLA (Pre-NR)	-	-	0.0%
Occ Dth Marr AK COLA (Post-NR)	56	56	0.0%
Total Death PVB	4,003	4,004	0.0%
D: 177	,	ŕ	
<u>Disability:</u> Non-vested LS Ben			0.0%
	-	-	0.0%
Dis (Pre-NR Conversion Benefit)	-	-	
Dis (Post-NR Conversion Benefit)	-	-	0.0%
Dis AK COLA (Pre-NR)	-	-	0.0%
Dis AK COLA (Post-NR)	-	-	0.0%
Dis Death Ben	-	-	0.0%
Dis Death Ben AK COLA	-	-	0.0%
Dis Child Ben	-	-	0.0%
Dis Child Ben AK COLA	-	-	0.0%
Total Disability PVB	-	-	0.0%
GRAND TOTAL PVB	797,080	797,080	0.0%



Actuarial Review of Pension and Health Plans - June 30, 2020

Comparison of Present Value of Benefits - **TRS Pension**Active Test Case 2 - Tier 2

Basic Data:	Current Age 49.32	Credited Service 14.90	Gender Female
Present Value of Benefits (PVB)	GRS Replicate	Conduent	% Diff
Retirement:			
Main Retirement Benefit	301,800	301,800	0.0%
AK COLA	9,310	9,310	0.0%
Total Retirement PVB	311,110	311,110	0.0%
Withdrawal:			
Non Vested Term	-	-	0.0%
Vested Term	37,472	37,472	0.0%
Vested Term AK COLA	1,227	1,227	0.0%
Vested Term (death during deferral)	143	150	-4.7%
Vested Term (death during deferral AK COLA)	5	5	-2.4%
Vested Term (death, single)	82	87	-6.0%
Total Withdrawal PVB	38,928	38,940	0.0%
Death:			
Non Vested NonOcc 1 <svc<5 dth<="" ls="" td=""><td></td><td></td><td>0.0%</td></svc<5>			0.0%
NonOcc Dth Marr	1,333	1,332	0.1%
NonOcc Dth Marr AK COLA	35	35	0.1%
NonOcc Single LS Dth	351	351	0.0%
Occ Dth Marr (Pre-NR Conversion Benefit)	66	66	0.5%
Occ Dth Marr (Post-NR Conversion Benefit)	630	631	-0.2%
Occ Dth Marr AK COLA (Pre-NR)	-	-	0.0%
Occ Dth Marr AK COLA (Post-NR)	18	18	-0.2%
Total Death PVB	2,434	2,433	0.0%
Disability:			
<u>Disability:</u> Non-vested LS Ben	_	_	0.0%
Dis (Pre-NR Conversion Benefit)	646	646	0.0%
Dis (Post-NR Conversion Benefit)	1,512	1,526	-0.9%
Dis AK COLA (Pre-NR)	38	38	0.0%
Dis AK COLA (Post-NR)	76	77	-0.9%
Dis Death Ben	1	1	0.0%
Dis Death Ben AK COLA	0	0	0.0%
Dis Child Ben	_	_	0.0%
Dis Child Ben AK COLA	_	_	0.0%
Total Disability PVB	2,273	2,288	-0.7%
GRAND TOTAL PVB	354,744	354,771	0.0%



Actuarial Review of Pension and Health Plans - June 30, 2020

Comparison of Present Value of Benefits - **TRS Pension**Active Test Case 3 - Tier 2

Basic Data:	Current Age	Credited Service	Gender
	40.75	10.00	Female
Present Value of Benefits (PVB)	GRS Replicate	Conduent	% Diff
Retirement:			
Main Retirement Benefit	191,690	191,690	0.0%
AK COLA	5,122	5,122	0.0%
Total Retirement PVB	196,812	196,812	0.0%
Withdrawal:			
Non Vested Term	-	-	0.0%
Vested Term	22,343	22,343	0.0%
Vested Term AK COLA	736	736	0.0%
Vested Term (death during deferral)	109	110	-0.9%
Vested Term (death during deferral AK COLA)	4	4	6.8%
Vested Term (death, single)	92	75	23.0%
Total Withdrawal PVB	23,284	23,267	0.1%
Death:			
Non Vested NonOcc 1 <svc<5 dth<="" ls="" td=""><td>_</td><td>_</td><td>0.0%</td></svc<5>	_	_	0.0%
NonOcc Dth Marr	834	833	0.0%
NonOcc Dth Marr AK COLA	17	17	0.1%
NonOcc Single LS Dth	230	230	0.0%
Occ Dth Marr (Pre-NR Conversion Benefit)	70	70	0.0%
Occ Dth Marr (Post-NR Conversion Benefit)	395	393	0.5%
Occ Dth Marr AK COLA (Pre-NR)	-	-	0.0%
Occ Dth Marr AK COLA (Post-NR)	9	9	0.4%
Total Death PVB	1,555	1,553	0.2%
<u>Disability:</u>			
Non-vested LS Ben	-	_	0.0%
Dis (Pre-NR Conversion Benefit)	935	935	0.0%
Dis (Post-NR Conversion Benefit)	1,525	1,525	0.0%
Dis AK COLA (Pre-NR)	54	54	0.0%
Dis AK COLA (Post-NR)	76	76	0.0%
Dis Death Ben	21	21	0.0%
Dis Death Ben AK COLA	1	1	0.0%
Dis Child Ben	80	79	1.1%
Dis Child Ben AK COLA	5	5	0.0%
Total Disability PVB	2,697	2,696	0.0%
GRAND TOTAL PVB	224,348	224,328	0.0%



Actuarial Review of Pension and Health Plans - June 30, 2020

Comparison of Present Value of Benefits - **PERS Active Pension**Active Test Case 1 - P/F Tier 1

Basic Data:	Current Age 61.3	Credited Service 22.6	<u>Gender</u> Male
Present Value of Benefits (PVB)	GRS	Buck	% Diff
Retirement:			
Main Retirement Benefit	624 756	631,755	0.0%
AK COLA	631,756 35,122	35,122	0.0%
Total Retirement PVB	666,878	666,877	0.0%
Withdrawal:	,	, .	
Non Vested Term	-	-	0.0%
Vested Term	-	-	0.0%
Vested Term AK COLA	-	-	0.0%
Vested Term (take LS)	-	-	0.0%
Vested Term (death during deferral)	-	-	0.0% 0.0%
Vested Term (death during deferral AK COLA) Total Withdrawal PVB	_	-	0.0% 0.0%
Total Withdrawal FVB	_	-	0.0 /a
<u>Death:</u>			
Non Vested NonOcc <1 svc LS Dth	-	-	0.0%
Non Vested NonOcc 1 <svc<5 dth<="" ls="" td=""><td>-</td><td>-</td><td>0.0%</td></svc<5>	-	-	0.0%
NonOcc Dth Marr	1,464	1,464	0.0%
NonOcc Dth Marr AK COLA	80	80	0.0%
NonOcc Married LS Dth	124	124	0.0%
NonOcc Single LS Dth	219	219	0.0%
Occ Dth Marr (Pre-NR Conversion Benefit)	-	-	0.0%
Occ Dth Marr (Post-NR Conversion Benefit)	10,620	10,655	-0.3%
Occ Dth Marr AK COLA (Post-NR)	583	582	0.3%
Occ Single LS Dth	658	658	0.0%
Total Death PVB	13,748	13,781	-0.2%
<u>Disability:</u>			
Non-vested LS Ben	_	_	0.0%
NonOcc Dis	-	-	0.0%
NonOcc Dis AK COLA	-	-	0.0%
Occ Dis (Pre-NR Conversion Benefit)	-	-	0.0%
Occ Dis (Post-NR Conversion Benefit)	-	-	0.0%
Occ Dis AK COLA (Pre-NR)	-	-	0.0%
Occ Dis AK COLA (Post-NR)	-	-	0.0%
Dis Death Ben	-	-	0.0%
Dis Death Ben AK COLA	-	-	0.0%
Total Disability PVB	-	-	0.0%
GRAND TOTAL PVB	680,626	680,659	0.0%



Actuarial Review of Pension and Health Plans - June 30, 2020

Comparison of Present Value of Benefits - **PERS Active Pension**Active Test Case 2 - Other Tier 2

Basic Data:	Current Age 50.2	Credited Service 26.6	Gender Male
Present Value of Benefits (PVB)	GRS	Buck	% Diff
Retirement:			
Main Retirement Benefit	684,092	684,092	0.0%
AK COLA	18,452	18,452	0.0%
Total Retirement PVB	702,544	702,544	0.0%
Withdrawal:			
Non Vested Term	-	-	0.0%
Vested Term	42,818	42,818	0.0%
Vested Term AK COLA	1,611	1,611	0.0%
Vested Term (take LS)	990	991	-0.1%
Vested Term (death during deferral)	351	363	-3.3%
Vested Term (death during deferral AK COLA)	15	14	9.5%
Total Withdrawal PVB	45,784	45,796	0.0%
Death:			
Non Vested NonOcc <1 svc LS Dth	-	-	0.0%
Non Vested NonOcc 1 <svc<5 dth<="" ls="" td=""><td>-</td><td>-</td><td>0.0%</td></svc<5>	-	-	0.0%
NonOcc Dth Marr	2,255	2,255	0.0%
NonOcc Dth Marr AK COLA	62	62	0.2%
NonOcc Married LS Dth	61	61	-0.2%
NonOcc Single LS Dth	404	405	-0.2%
Occ Dth Marr (Pre-NR Conversion Benefit)	136	137	-0.5%
Occ Dth Marr (Post-NR Conversion Benefit)	3,296	3,284	0.4%
Occ Dth Marr AK COLA (Post-NR)	97	98	-0.5%
Occ Single LS Dth	269	270	-0.2%
Total Death PVB	6,580	6,571	0.1%
<u>Disability:</u>			
Non-vested LS Ben	-	-	0.0%
NonOcc Dis	2,159	2,159	0.0%
NonOcc Dis AK COLA	127	127	0.0%
Occ Dis (Pre-NR Conversion Benefit)	158	158	0.0%
Occ Dis (Post-NR Conversion Benefit)	1,190	1,190	0.0%
Occ Dis AK COLA (Pre-NR)	11	11	-0.1%
Occ Dis AK COLA (Post-NR)	71	71	0.0%
Dis Death Ben	-	-	0.0%
Dis Death Ben AK COLA	-	-	0.0%
Total Disability PVB	3,715	3,715	0.0%
GRAND TOTAL PVB	758,624	758,627	0.0%



Actuarial Review of Pension and Health Plans - June 30, 2020

Comparison of Present Value of Benefits - **PERS Active Pension**Active Test Case 3 - P/F Tier 3

Basic Data:	Current Age	Credited Service	Gender
	38.4	18.0	Male
Present Value of Benefits (PVB)	GRS	Buck	% Diff
Retirement:			
Main Retirement Benefit	853,053	853,052	0.0%
AK COLA	12,367	12,367	0.0%
Total Retirement PVB	865,420	865,420	0.0%
<u>Withdrawal:</u>			
Non Vested Term	-	_	0.0%
Vested Term	6,684	6,684	0.0%
Vested Term AK COLA	235	235	0.0%
Vested Term (take LS)	845	845	0.0%
Vested Term (death during deferral)	93	92	1.4%
Vested Term (death during deferral AK COLA)	3	3	3.8%
Total Withdrawal PVB	7,860	7,858	0.0%
<u>Death:</u>			
Non Vested NonOcc <1 svc LS Dth	-	-	0.0%
Non Vested NonOcc 1 <svc<5 dth<="" ls="" td=""><td>-</td><td>-</td><td>0.0%</td></svc<5>	-	-	0.0%
NonOcc Dth Marr	919	912	0.8%
NonOcc Dth Marr AK COLA	13	13	0.6%
NonOcc Married LS Dth	52	53	0.0%
NonOcc Single LS Dth	93	93	0.0%
Occ Dth Marr (Pre-NR Conversion Benefit)	62	62	-0.3%
Occ Dth Marr (Post-NR Conversion Benefit)	6,336	6,334	0.0%
Occ Dth Marr AK COLA (Post-NR)	94	95	-1.0%
Occ Single LS Dth	278	278	0.0%
Total Death PVB	7,847	7,841	0.1%
<u>Disability:</u>			
Non-vested LS Ben	-	-	0.0%
NonOcc Dis	328	328	0.0%
NonOcc Dis AK COLA	17	17	-0.1%
Occ Dis (Pre-NR Conversion Benefit)	68	68	0.0%
Occ Dis (Post-NR Conversion Benefit)	953	952	0.2%
Occ Dis AK COLA (Pre-NR)	4	4	0.2%
Occ Dis AK COLA (Post-NR)	51	51	0.2%
Dis Death Ben	47	41	14.9%
Dis Death Ben AK COLA	3	2	31.4%
Total Disability PVB	1,473	1,464	0.6%
GRAND TOTAL PVB	882,600	882,583	0.0%



Actuarial Review of Pension and Health Plans Active Pension Test Case Legend				
Benefit Extended Description				
Retirement: Main Retirement Benefit AK COLA	Early/Normal Retirement (base) Benefit Alaska Cost of Living Allowance (10% of Ret base benefit)			
Withdrawal: Non Vested Term Vested Term Vested Term AK COLA Vested Term (take LS) Vested Term (death during deferral) Vested Term (death during deferral AK COLA) Vested Term (death, single)	Refund of employee contributions upon termination of non-vested member Deferred retirement (base) Benefit (deferred to early retirement eligibility) Alaska Cost of Living Allowance (10% of Term base benefit) Refund of employee contributions upon termination of (vested) member Death (base) Benefit payable upon death after withdrawal but before benefit commencement Alaska Cost of Living Allowance (10% of DV Dth base benefit) Return of employee contributions upon death during deferral period for single members			
Death: Non Vested NonOcc 1 <svc<5 (post-nr="" (post-nr)="" (pre-nr="" (pre-nr)="" ak="" benefit)="" cola="" conversion="" dth="" dth<="" ls="" marr="" married="" nonocc="" occ="" single="" td=""><td>Refund of employee contributions upon death of non-vested member Non-Occupational Death (base) benefit Alaska Cost of Living Allowance (10% of Non-Occupational Dth base benefit) Refund of employee contributions upon non-occupational death of married (vested) member Refund of employee contributions upon non-occupational death of single (vested) member Occupational Death (base) benefit until normal retirement conversion Occupational Death (base) benefit after normal retirement conversion Alaska Cost of Living Allowance (10% of Occupational Dth base benefit pre-conversion) Alaska Cost of Living Allowance (10% of Occupational Dth base benefit post-conversion) Refund of employee contributions upon occupational death of single (vested) member</td></svc<5>	Refund of employee contributions upon death of non-vested member Non-Occupational Death (base) benefit Alaska Cost of Living Allowance (10% of Non-Occupational Dth base benefit) Refund of employee contributions upon non-occupational death of married (vested) member Refund of employee contributions upon non-occupational death of single (vested) member Occupational Death (base) benefit until normal retirement conversion Occupational Death (base) benefit after normal retirement conversion Alaska Cost of Living Allowance (10% of Occupational Dth base benefit pre-conversion) Alaska Cost of Living Allowance (10% of Occupational Dth base benefit post-conversion) Refund of employee contributions upon occupational death of single (vested) member			
Disability: Non-vested LS Ben Dis (Pre-NR Conversion Benefit) Dis (Post-NR Conversion Benefit) Dis AK COLA (Pre-NR) Dis AK COLA (Post-NR) Dis Death Ben Dis Death Ben AK COLA Dis Child Ben Dis Child Ben AK COLA	Refund of employee contributions payable upon disability before vested Disability benefit prior to normal retirement conversion Disability benefit after normal retirement conversion Alaska Cost of Living Allowance (10% of pre-conversion disability benefit) Alaska Cost of Living Allowance (10% of post-conversion disability benefit) Death (base) Benefit payable upon death after disability Alaska Cost of Living Allowance (10% of Dis Dth base benefit) Disability (base) Child Benefit payable until eligible for normal retirement Alaska Cost of Living Allowance (10% of Temp Dis Child base benefit)			



Actuarial Review of Pension and Health Plans - June 30, 2020 Comparison of Present Value of Benefits - **TRS Retiree Health**

Actives	Test Case 1 - Tier 1		
Basic Data:			
Sex	Female		
Current Age	53.88		
Current Credited Service	29.80		
Present Value of Benefits (PVB)	GRS	Buck	% Diff
Retirement:			
Tier x <member></member>	192,295	192,258	0.0%
Tier x <spouse></spouse>	99,451	99,386	0.1%
Post 65 Part D Tier x < Member>	(17,351)	(17,348)	0.0%
Post 65 Part D Tier x <spouse></spouse>	(10,163)	(10,162)	0.0%
Contrib <member></member>	-	-	0.0%
Contrib <spouse></spouse>	-	-	0.0%
Total Retirement PVB	264,232	264,134	0.0%

Test Case 2 - Tier 2			
Female			
49.32			
14.90			
GRS	Buck	% Diff	
120,103	120,080	0.0%	
60,112	56,507	6.4%	
(12,610)	(12,608)	0.0%	
(7,428)	(7,427)	0.0%	
(2,049)	(2,085)	-1.8%	
(1,225)	(1,247)	-1.8%	
156,902	153,220	2.4%	

Inactives - PVB	GRS	Buck	% Diff
Retiree - Female	91,040	91,027	0.0%
Vested Termination - Female	253,152	252,880	0.1%
Disabled - Male	96,845	96,872	0.0%

Benefits - Buck Valuation Terminology	Description
Retirement:	
Tier x <member></member>	Base Benefit Paid to Employee
Tier x <spouse></spouse>	Base Benefit Paid to Spouse
Contrib <member></member>	Employee Pre-Retirement Contributions
Contrib <spouse></spouse>	Spouse Pre-Retirement Contributions
Post 65 Part D < Member>	Employee Post-Age 65 Medicare Part D Reimbursement
Post 65 Part D <spouse></spouse>	Spouse Post-Age 65 Medicare Part D Reimbursement



Actuarial Review of Pension and Health Plans - June 30, 2020 Comparison of Present Value of Benefits - **PERS Retiree Health**

Actives	Test Case 1 - PF Tier 1		
Basic Data:			
Sex	Active		
Current Age	61.26		
Current Credited Service	22.58		
Present Value of Benefits (PVB)	GRS*	Buck	% Diff
Retirement:			
Tier x <member></member>	125,239	125,241	0.0%
Tier x <spouse></spouse>	122,991	122,986	0.0%
Contrib Tier x < Member>	-	-	0.0%
Contrib Tier x <spouse></spouse>	-	-	0.0%
Post 65 Part D Tier x < Member>	17,528	17,530	0.0%
Post 65 Part D Tier x <spouse></spouse>	13,329	13,330	0.0%
Total Retirement PVB	217,373	217,367	0.0%

Test Case 2 - Other Tier 2		
Male		
50.17		
30.46		
GRS	Buck	% Diff
171,056	171,018	0.0%
129,473	128,318	0.9%
-	-	0.0%
-	-	0.0%
12,576	12,574	0.0%
8,122	8,121	0.0%
279,830	278,641	0.4%

Male		
38.42		
18.04		
GRS	Buck	% Diff
179,841	180,716	-0.5%
150,644	149,632	0.7%
5,792	5,844	-0.9%
4,378	4,417	-0.9%
10,182	10,239	-0.6%
7,524	7,579	-0.7%
302,609	302,269	0.1%

Test Case 3 - P/F Tier 3

Inactives - PVB	GRS	Buck	% Diff
Retiree - P/F Tier 2 - Female	75,774	75,766	0.0%
Beneficiary - P/F Tier 2 - Female	83,401	83,391	0.0%
Vested Termination - P/F Tier 3 - Male	243,669	239,695	1.7%
Retiree - Other Tier 2 - Female	181,915	181,885	0.0%
Beneficiary - Other Tier 1 - Male	82,929	82,917	0.0%
Vested Termination - Other Tier 1 - Male	124,744	124,732	0.0%

Benefits - Buck Valuation Terminology	Description
Retirement:	
Tier x <member></member>	Base Benefit Paid to Employee
Tier x <spouse></spouse>	Base Benefit Paid to Spouse
Contrib <member></member>	Employee Pre-Retirement Contributions
Contrib <spouse></spouse>	Spouse Pre-Retirement Contributions
Post 65 Part D < Member>	Employee Post-age 65 Medicare Part D Reimbursement
Post 65 Part D <spouse></spouse>	Spouse Post-age 65 Medicare Part D Reimbursement





SAMPLE LIFE REVIEW — PERS DCR AND TRS DCR

Sample Life Review – PERS DCR and TRS DCR

We reviewed sample test cases used for the DCR June 30, 2020, valuation draft reports. In order to accomplish this, we requested a number of sample cases from Buck with intermediate statistics to assist us in analyzing the results.

We combined this with our understanding of the plan provisions in an attempt to analyze the liability values produced by Buck for these sample cases only.

Conclusion and Results:

The exhibits that follow provide a comparison of the calculations by decrement provided to us from Buck against our replication of those benefits as we interpret them from the plan provisions and assumptions. We completed this detail for three active test lives under the PERS and TRS DCR and for two disabled test lives.

We conclude that the test lives are calculated correctly using the underlying assumptions.



Actuarial Review of DCR Pension and Health Plans - June 30, 2020

Comparison of Present Value of Benefits - DCR PERS and TRS Pension

Actives	Test Case 1 - PERS Other		
Basic Data:		Basic Data:	
Sex	Female	Tier	4
Current Age	38.675	Full time %	100%
Current Credited Service	1.81		
Present Value of Benefits (PVB)	GRS*	Buck	% Diff
Disability:			
DCR	639	639	0.0%
DCR Death during Disability	36	35	2.0%
Total Disability PVB	675	674	0.1%
Death:			
DCR - married only	286	286	0.0%
Total Death PVB	286	286	0.0%
GRAND TOTAL PVB	961	960	0.1%

Actives	Test Case 3 - TRS			
Basic Data:		Basic Data:		
Sex	Female	Tier	3	
Current Age	46.09	Full time %	100%	
Current Credited Service	7.00			
Present Value of Benefits (PVB)	GRS*	Buck	% Diff	
<u>Disability:</u>				
DCR	353	353	0.0%	
DCR Death during Disability	18	18	-0.4%	
Total Disability PVB	371	371	0.0%	
Death:				
DCR - married only	202	202	0.0%	
Total Death PVB	202	202	0.0%	
GRAND TOTAL PVB	573	573	0.0%	

Actives	Test Case 2 - PERS PF			
Basic Data:		Basic Data:		
Sex	Male	Tier	4	
Current Age	42.49	Full time %	100%	
Current Credited Service	8.80			
Present Value of Benefits (PVB)	GRS*	Buck	% Diff	
<u>Disability:</u>				
DCR Deferred - single	661	661	0.0%	
DCR Deferred - married	4,740	4,740	0.0%	
DCR Immediate	2,940	2,939	0.0%	
DCR Imm. Death during Disability	272	272	0.1%	
Total Disability PVB	8,613	8,612	0.0%	
<u>Death:</u>				
DCR - married only	2,805	2,805	0.0%	
Total Death PVB	2,805	2,805	0.0%	
GRAND TOTAL PVB	11,418	11,418	0.0%	

Benefits - Buck Valuation Terminology		
<u>Disability:</u>		
DCR Deferred Ben	Disability benefit payable upon eligibility for retirement (based on ret plan formula)	
DCR Immed Ben	Disability benefit payable until eligible for normal retirement (based on ret plan formula)	
DCR	Occupational base disability benefit based on percent of pay (40% of salary)	
DCR Death during Disable	Death benefit payable upon death while on disability	
<u>Death:</u>		
DCR - married only	Occupational death benefit payable as annuity to spouse	

* GRS' audit of Buck's calculation includes review of the benefit amounts, annuity values, assumptions and other factors related to the PVB calculation at each projected age. Differences may exist due to different interpretations of the statutes, as well as additional items as discussed throughout this audit report.



Actuarial Review of DCR Pension and Health Plans - June 30, 2020

Comparison of Present Value of Benefits - DCR PERS and TRS Retiree Health

Actives	Test Ca	Test Case 1 - PERS Other			
Basic Data:		Basic Data:			
Sex	Female	Tier	4		
Current Age	38.67	Full time %	100%		
Current Credited Service	1.30				
Present Value of Benefits (PVB)	GRS*	Buck	% Diff		
Retirement:					
Post 65 DCR < Member>	3,540	3,554	-0.4%		
Post 65 DCR <spouse></spouse>	1,928	1,935	-0.4%		
Contrib DCR <member></member>	(449)	(450)	-0.3%		
Contrib DCR <spouse></spouse>	(245)	(246)	-0.3%		
Post 65 Part D DCR < Member>	629	614	2.4%		
Post 65 Part D DCR <spouse></spouse>	342	334	2.4%		
Total Retirement PVB	5,746	5,741	0.1%		

Actives	Test Case 2 - PERS PF			
Basic Data:		Basic Data:		
Sex	Male	Tier	4	
Current Age	42.49	Full time %	100%	
Current Credited Service	8.80			
Present Value of Benefits (PVB)	GRS*	Buck	% Diff	
Retirement:				
Post 65 DCR <member></member>	13,476	13,535	-0.4%	
Post 65 DCR <spouse></spouse>	13,643	13,715	-0.5%	
Contrib DCR <member></member>	(1,499)	(1,515)	-1.1%	
Contrib DCR <spouse></spouse>	(1,540)	(1,559)	-1.2%	
Post 65 Part D DCR < Member>	2,413	2,392	0.9%	
Post 65 Part D DCR <spouse></spouse>	1,871	1,856	0.8%	
Total Retirement PVB	28,366	28,423	-0.2%	

Actives	Test Case 3 - TRS			
Basic Data:		Basic Data:		
Sex	Female	Tier	3	
Current Age	46.08	Full time %	100%	
Part-Time Credited Service	7.00			
Present Value of Benefits (PVB)	GRS*	Buck	% Diff	
Retirement:				
Post 65 DCR < Member>	11,194	11,217	-0.2%	
Post 65 DCR <spouse></spouse>	6,026	6,039	-0.2%	
Contrib DCR <member></member>	(1,522)	(1,484)	2.6%	
Contrib DCR <spouse></spouse>	(820)	(800)	2.5%	
Post 65 Part D DCR < Member>	1,911	1,923	-0.6%	
Post 65 Part D DCR <spouse></spouse>	1,028	1,034	-0.6%	
Total Retirement PVB	17,816	17,928	-0.6%	

Benefits - Buck Valuation Terminology			
Retirement:			
Post 65 DCR <member></member>	Base benefit paid to employee while employee is at least 65		
Post 65 DCR <spouse></spouse>	Base benefit paid to spouse while employee is at least 65		
Contrib DCR <member></member>	Employee pre-retirement contributions		
Contrib DCR <spouse></spouse>	Spouse pre-retirement contributions		
Post 65 Part D DCR <member></member>	Employee post-age 65 Medicare Part D reimbursement		
Post 65 Part D DCR <spouse></spouse>	Spouse post-age 65 Medicare Part D reimbursement		

^{*} GRS' audit of Buck's calculation includes review of the benefit amounts, annuity values, assumptions and other factors related to the PVB calculation at each projected age. Differences may exist due to different interpretations of the statutes, as well as additional items as discussed throughout this audit report.



Actuarial Review of DCR Pension and Health Plans - June 30, 2020

Comparison of Present Value of Benefits - DCR PERS Disability

Retirees	Test Case 4 - PERS Other		
Basic Data:		Basic Data:	
Sex	Female	Tier	4
Current Age	60.907	Type	Disability
Annual Benefit	30,546.62	Stop date	8/31/2024
	GRS*	Buck	% Diff
PVB - Disability Benefit	105,463	105,727	-0.2%
PVB - Post-retirement Medical Benefits	80,579	77,687	3.7%

1 VD - 1 OSt-letilelilelit Medical Delic	Sillo	00,575	77,007	3.7 70	
Retirees		Test Case 6 - TRS			
Basic Data:			Basic Data:		
Sex		Male	Tier	4	
Current Age		54.454	Type	Disability	
Annual Benefit		24,286.44	Stop date	1/31/2031	
		GRS*	Buck	% Diff	
PVB - Disability Benefit		197,313	196,453	0.4%	

72,972

75,144

PVB - Post-retirement Medical Benefits

Retirees	Test Case 5 - PERS PF		
Basic Data:		Basic Data:	
Sex	Male	Tier	4
Current Age	44.735	Туре	Disability
Annual Benefit	27,340.32	Stop date	1/31/2039
	GRS*	Buck	% Diff
PVB - Disability Benefit	392,894	393,524	-0.2%
PVB - Post-retirement Medical Benefits	67,288	67,838	-0.8%

* GRS' audit of Buck's calculation includes review of the benefit amounts, annuity values, assumptions and other factors related to the PVB calculation at each projected age. Differences may exist due to different interpretations of the statutes, as well as additional items as discussed throughout this audit report.

-2.9%





REVIEW OF CONTRIBUTION RATE DETERMINATION

Review of Contribution Rate Determination

Beginning with the actuarial valuations as of June 30, 2014, in accordance with Senate Bill 119 and House Bill 385, a contribution calculation methodology was incorporated in order to recognize the timing lag and recognize expected changes in the unfunded liability during the two-year delay.

GRS analyzed the roll forward methodology for the FY2023 Contribution Rate Calculation and verified the contribution rate computation (as shown in pages 20 - 22 of the PERS valuation report and pages 12 - 14 of the TRS valuation report). We verified the calculation of the layered amortization amount for FY23.

As noted in the Buck report, the compensation used to develop the rates is a combination of both this plan's compensation, as well as the DCR compensation.

Finally, Buck has determined two different compensation amounts-the "valuation" compensation which is the compensation used to determine future plan benefits and the liabilities for those benefits. This compensation annualizes permanent-part timer pay. The "rate" payroll is the payroll upon which the contributions are expected to be made, and does not annualize permanent part timer pay.

FINDINGS:

The calculations were generally reasonable and consistent with actuarial practice.





REVIEW OF ACTUARIAL VALUATION REPORT

Review of Actuarial Valuation Report

VALUATION REPORT:

GRS reviewed the June 30, 2020 valuation report for scope as well as content to determine if actuarial statistics were being reflected fairly and if the details of the plan were being correctly communicated. GRS did not review GASB 67/68/74/75 Accounting Information.

We consider the scope and content of Buck's report to be effective in communicating the financial position and contribution requirements of PERS and TRS.

We recommend the following, all of which have been discussed previously in the sections above.

- Update the COVID-19 experience line items in the gain/loss sections of both the PERS DB and TRS
 DB reports to indicate that these amounts are the difference between the actual and expected
 health claims during the last fiscal year, and then footnote those amounts explaining that the
 majority of the gains this year are due to COVID-19 experience. Furthermore, we recommend
 Buck keep these additional line items in future years so the difference between past experience
 and future expectations can be differentiated on the per capita claims costs assumptions.
- In addition to the PERS DCR withdrawal rate that was already updated for this year, review all of
 the rates in each report to be sure they are consistent with the rates being used in the actuarial
 calculations.
- Update the TRS DB report to indicate the actuarial assumptions being used for the Early Retirement Factors.
- Check consistency on the number of participating employers in PERS DB/DCR reports.



Alaska Retirement Management Board

Actuarial Review of the Judicial Retirement System Pension and Health Plans

Actuarial Review of the National Guard and Naval Militia Retirement System Pension Plan

April 23, 2021





April 23, 2021

Mr. Zach Hanna Chief Investment Officer Department of Revenue, Treasury Division Alaska Retirement Management Board P.O. Box 110405 Juneau, AK 99811-0405

Subject: Actuarial Review of June 30, 2020 valuations for the State of Alaska Judicial Retirement

System (JRS) and National Guard and Naval Militia Retirement System (NGNMRS)

Dear Zach:

We have performed an actuarial review of the June 30, 2020 Actuarial Valuations for JRS and NGNMRS.

This report includes a review of:

- Pension Assumptions and Benefits
- Actuarial Valuation Methods and Procedures
- Contribution Rate Determination
- Actuarial Valuation Report
- Potential Areas for Future Review

This report should be considered supplemental to the Actuarial Review of Pension and Post-Employment Healthcare Plans for PERS and TRS dated February 24, 2021. Only items unique to these plans were reviewed and discussed in this report.

A major part of our review is a thorough analysis of the test lives provided by Buck. We have included exhibits in our report that summarize the detailed analysis of these sample test cases for JRS and NGNMRS, as well as a comparison of the results between Buck and GRS. We wish to thank the staff of the State of Alaska Treasury Division and Buck, without whose willing cooperation this review could not have been completed.

Consultant

Bill Detweiler, ASA, FCA, MAAA

Sincerely,

Gabriel, Roeder, Smith & Company

Paul Wood, ASA, FCA, MAAA

Consultant

cc: Ms. Pamela Leary

Ms. Alysia Jones

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SECTION 1

EXECUTIVE SUMMARY

Executive Summary

Gabriel, Roeder, Smith & Co. was engaged by the Alaska Retirement Management Board (ARMB) to review the June 30, 2020 Actuarial Valuations of the State of Alaska Judicial Retirement System (JRS) and the National Guard and Naval Militia Retirement System (NGNMRS).

This report presents our findings in the following areas:

- General Approach
- Review of Assumptions
- Review of Actuarial Valuation Methods and Procedures (including the test lives review)
- Review of Contribution Rate Determination
- Review of Actuarial Valuation Report
- Potential Areas for Future Review
- Summary and Conclusions

In general, we found that the Buck's actuarial results and reports were reasonable and find the assumptions consistent with generally accepted actuarial practice.

Monthly conference calls conducted between Buck and GRS were made this year and contributed greatly to resolving issues more quickly and thoroughly. Those issues, even if resolved, are highlighted in this report.

KEY FINDINGS FROM THE AUDIT OF THE JUNE 30, 2020 VALUATIONS

- We recommend Buck continue to carefully monitor the newly adopted assumptions going forward to determine if they are working as intended.
- We recommend Buck review with the Board whether to implement a new entrant assumption for the JRS plan.
- We recommend Buck continue to disclose the nature and impact of all programming changes included in the valuation.
- We recommend that Buck implement the changes to their valuation methods as detailed in Section 6 of this report
- We recommend consideration of a longer period over which to amortize the NGNMRS surpluses. This could help manage rate volatility, which could be especially useful in a plan exhibiting data quality and volatility issues.
- We recommend Buck make some small modifications to their valuation reports to improve communication and disclosure.



BUCK'S IMPLEMENTATION OF RECOMMENDATIONS FROM PRIOR REVIEW REPORT

As part of the June 30, 2018 actuarial review, we made some recommendations that were implemented by Buck in the June 30, 2020 valuation. These recommendations included the following:

- We recommend the annuity factor used for the lump sum portion of the benefit be consistent with how the benefit would be administered and not include a lump sum payable to the spouse in the event of the members' death.
- We recommend Buck make some small modifications to their valuation reports to improve communicator and make them more consistent.

SUMMARY OF TEST LIFE REVIEW

We have included as a part of this report a detailed test life results summary.

- We identified one finding related to the actuarial assumptions for JRS Early Retirement Factors. This finding was clarified by Buck and should be disclosed appropriately in the report.
- We identified one finding related to the death benefit for current retirees in the NGNMRS valuation. This finding, while may be viewed as immaterial, should, at the very least, be updated in future valuations, subject to Actuarial Committee discretion.
- We matched the present value of benefits closely in total on all other test lives submitted. We
 have included exhibits in Section 6 of the report that summarize the differences in calculations by
 decrement for the test lives analyzed. Differences between actuarial firms will always occur due to
 system differences and other nuances in the calculations.



SECTION 2

GENERAL APPROACH

General Approach

Gabriel, Roeder, Smith & Co. was charged with reviewing the actuarial assumptions of the pension actuarial valuations of JRS and NGNMRS and the health care actuarial valuation of JRS.

We requested a number of items from Buck Consultants in order to perform the actuarial review and health cost assumption review:

- 1. We received the draft report for JRS in February of 2021. We received the test lives in November of 2020 for pension and retiree health.
- 2. We received the draft report for NGNMRS in February of 2021. We received the pension test lives in February of 2021.
- 3. Monthly conference calls between Buck and GRS occurred, with the agenda items including timing of deliverables and the discuss of audit matters.

In performing our review, we:

- 4. Reviewed actuarial assumptions we checked to see if they were consistent, comprehensive, and appeared reasonable.
- 5. Reviewed the actuarial valuation reports as of June 30, 2020, for completeness and a review of financial determinations.
- 6. Reviewed, in detail, the sample members provided us This provided us with a perspective on the actuarial process utilized by Buck with respect to the plan and allowed us to review the valuation methods and procedures.
- 7. Reviewed the health care plan cost assumptions and trend for JRS.

KEY ACTUARIAL CONCEPTS

An actuarial valuation is a detailed statistical simulation of the future operation of a retirement system using the set of actuarial assumptions adopted by the Board. It is designed to simulate all of the dynamics of such a system for each current system member including:

- 1. Earning future service and making contributions,
- 2. Receiving changes in compensation,
- 3. Leaving the system through job change, disablement, death, or retirement, and
- 4. Determination of and payment of benefits from the System.

This simulated dynamic is applied to each active member of the System. It results in a set of expected future benefit payments to that member. Bringing those expected payments to present value, at the assumed rate of investment return, produces the Actuarial Present Value ("APV") of future benefits for that member. In like manner, an APV of future salaries is determined.



The actuarial present value of future benefits and the actuarial present value of future salaries for the entire System are the total of these values across all members. The remainder of the actuarial valuation process depends upon these building blocks.

Once the basic results are derived, an actuarial method is applied in order to develop information on contribution levels and funding status. An actuarial method splits the APV of future benefits into two components:

- 1. Present Value of Future Normal Costs, and
- 2. Actuarial Accrued Liability ("AAL")

The actuarial method in use by the State of Alaska is known as the Entry Age Normal (EAN) method. Under entry age normal funding method, the Normal Cost for a member is that portion of the Actuarial Present Value of the increase in the value of that member's benefit for service during the upcoming year. The actuarial accrued liability is the difference between the total actuarial present value and the present value of all future normal costs.

For JRS and NGNMRS, the present value of future benefits applies to the following benefits:

- Retirement benefits
- Withdrawal benefits
- Disability benefits
- Death benefits
- Return of contributions
- Medical benefits (JRS only)

The retiree medical benefits are based on potential future health care benefits, while the others are a type of post-employment income replacement benefit, based on salary. For the medical benefits, estimates must be made of the future health care costs. This is done by determining current per capita health care claim costs by age of retiree, and projecting them into the future based on anticipated future health care inflation. Per capita claims used were those used in the PERS and TRS valuations as of June 30, 2020 and the methodology used to determine those claims was found to be appropriate in the audit of those plans. Please refer to the PERS and TRS audit report for further information pertaining to the claims cost development.



SECTION 3

REVIEW OF GAINS AND LOSSES

Review of Gains and Losses

As a part of the annual audit, we take a historical look at the gains and losses on the accrued liability. Gains and losses may measure "how closely" experience matches the actuarial assumption. Recurring gains or losses may indicate an assumption that is not meeting the actual experience for this population. In the tables below, we detail the historical gains and losses for each plan. In addition, we have shown the gain or loss as a percent of the beginning of year (BOY) accrued liability (AL).

JRS PENSION GAINS AND (LOSSES) BY SOURCE (000'S)

<u>Source</u>		2020	<u>2018</u>		
		aluation_	<u>Valuation</u>		
Retirement	\$	(1,596)	\$	1,239	
Termination		535		(790)	
Mortality		1,467		(889)	
Disability		8		7	
New Entrants		(2 <i>,</i> 857)		(998)	
Other		(879)		485	
Salary		(392)		4,581	
COLA		(361)		8,482	
Total G/L	\$	(4,075)	\$	12,117	
Total AL at BOY	\$	226,560	\$	205,548	
G/L as a % of AL		-1.80%		5.89%	

Buck started showing gain/loss detail for JRS beginning with the June 30, 2018 valuation. 2018 gains and losses are prior to the implementation of new assumptions, so this is the first valuation where we can examine experience under the most recently adopted assumptions.

The \$4 million loss in the most recent valuation is predominantly made up of new entrants and more retirements than expected. Also, the increase in salaries was more than assumed, resulting in losses to both active members and the COLA for retired members. These losses were also offset by mortality gains, meaning more deaths than expected.

Buck does not make any assumption for new active members entering the plan, so there will always be new entrant losses. We recommend Buck review with the Board whether to implement a new entrant assumption for this plan.

The other gains and losses will need to be continuously and carefully monitored going forward to determine if the current assumptions are working as intended.



JRS HEALTHCARE GAINS AND (LOSSES) BY SOURCE (000'S)

<u>Source</u>		<u>2020</u> aluation	<u>2018</u> <u>Valuation</u>		
Retirement	\$	342	\$	(188)	
Termination		(4)		(2)	
Mortality		421		27	
Disability		10		7	
New Entrants		(271)) (31		
Other		(488)		319	
Medical Claims		2,287		1,843	
Modified Part B Assumption		9		(41)	
Cadillac Tax		234		(233)	
Total	\$	2,540	\$	1,415	
Total AL at BOY	\$	16,847	\$	15,731	
G/L as a % of AL		L5.08%		8.99%	

Buck started showing gain/loss detail for JRS beginning with the June 30, 2018 valuation. 2018 gains and losses are prior to the implementation of new assumptions, so this is the first valuation where we can examine experience under the most recently adopted assumptions.

Overall, there was a \$3 million gain on the JRS DB Healthcare results. This is mostly due to positive experience on the medical claims and is consistent with the experience from the PERS and TRS healthcare plans. All of our discussion and recommendations on the retiree healthcare plans from that review report holds for the JRS retiree healthcare plan as well.



NGNMRS PENSION GAINS AND (LOSSES) BY SOURCE (000'S)

Buck does not show gain/loss detail for NGNMRS. As shown on page 6 of the NGNMRS valuation report, the plan experienced as \$572 thousand liability gain during fiscal year 2020. Buck did note that \$523 thousand of this gain was attributable to programming changes made based on comments from GRS during the June 30, 2018 actuarial review. This only leaves a small 'other' gain of \$49 thousand dollars.

Buck should continue to monitor the gains/loss for this plan to make sure the assumptions are working as intended and show more detail if necessary.

SUMMARY OF RECOMMENDATIONS RESULTING FROM A REVIEW OF GAINS AND LOSSES

Based on our review above, we recommend the following be considered by Buck:

- Continue to carefully monitor the most recently adopted assumptions going forward to determine if they are working as intended.
- Continue to disclose the nature and impact of all programming changes included in the valuation.
- Discuss with the Board whether to include a new entrant assumption for the JRS plan.



SECTION 4

REVIEW OF ASSUMPTIONS

Review of Actuarial Assumptions

Buck released an experience study in 2018 and the Board approved a new assumption set to be used beginning with the actuarial valuations as of June 30, 2018.

Although this audit examines many assumptions and methods, not all of them are equal in terms of their ultimate impact on contribution rates. It is not the intention of this audit to imply that all proposed changes would have a similar impact on the liabilities. For example, the investment return assumption may be the greatest lever in influencing contribution rates. Thus, where options exist for spending time and resources studying assumptions, we recommend studying those with the largest impact first.

ECONOMIC ASSUMPTIONS

General

These assumptions simulate the impact of economic forces on the amounts and values of future benefits. Key economic assumptions are the assumed rate of investment return and assumed rates of future salary increase.

Economic assumptions are normally defined by an underlying inflation assumption. Buck has cited 2.50% as the inflation assumption. In recent years, long-term inflation forecasts have been declining and this assumption will need to be monitored. We do find the assumption to be reasonable at this time.

Investment Return Assumption

The nominal investment return assumption for JRS is 7.38%, which is the same as PERS and TRS. Our discussion on this assumption from that review report holds for JRS as well.

The nominal investment return assumption for NGNMRS is 7.00%. We find this assumption to be reasonable.

Member Pay Increase Assumption

The pay increase assumption for JRS is 3.62%. This assumption was not studied or updated during the most recent experience study, due to a lack of credible data. This assumption should be carefully monitored to be sure it continues to be reasonable.

COLA

We find the 3.62% assumption for JRS to be reasonable. The rate is directly tied to pay increases.

DEMOGRAPHIC ASSUMPTIONS

Healthy mortality during active service and after termination

The RP-2014 tables with MP 2017 generational improvement (and with the various credibility adjustments) are reasonable.



Disabled mortality

The RP 2014 disabled table with MP 2017 generational improvement (and with the various credibility adjustments) is reasonable.

Withdrawal from service before retirement (termination)

The rates look reasonable based on the data presented in the experience study report.

Retirement

The rates look reasonable based on the data presented in the experience study report.

Disability

The rates look reasonable based on the data presented in the experience study report.

Form of Payment

The form of payment assumptions for NGNMRS look reasonable based on the data presented in the experience study report.

Payroll Growth

Contribution rates are based on a percent of total payroll for JRS. The assumption used in the valuation is that payroll will grow at a rate of 2.75 percent per year. During fiscal years 2019 and 2020 the payroll grew by less than 2%, or less than 1% per year on average.

Payroll growth is significant because the unfunded accrued liability (UAL) is amortized as a level percentage of pay. That is the same as expecting all future amortization payments to grow at the same rate as total payroll. When payroll does not grow as assumed then the UAL is not going to be paid off as assumed. In order for the UAL to be paid off according to the current amortization schedule, payroll must grow at the assumed payroll growth rate. If payroll does not grow at that rate, as was the case for the past couple years, there will be upward pressure on the contribution rate because contributions that are less than anticipated are flowing in the plan.

Data

Buck spends a significant amount of time and effort reconciling the NGNMRS data and has to make a series of assumptions regarding the data due to its quality. We would recommend that Buck include some additional detail showing proportion of data that has imputed elements.

Healthcare Cost Assumptions

The health care cost assumptions for JRS are the same as PERS and TRS. Our discussion on these assumptions from that review report holds for JRS as well.



SUMMARY

With this being the first valuation of experience under the new assumptions, it is too soon to ascertain their effectiveness, although we can start to monitor any developing trends. Based on the experience study data presented, the assumptions and methods are reasonable. We will continue to monitor the results to track the effectiveness of the assumptions with regards to valuing plan costs.



SECTION 5

REVIEW OF ACTUARIAL VALUATION METHODS AND PROCEDURES

Review of Actuarial Valuation Methods and Procedures

I. Background

An actuarial valuation is a detailed statistical simulation of the future operation of a retirement system using the set of actuarial assumptions adopted by the Board.

The actuarial values generated from this process are based not only on these assumptions, but also on the additional assumptions built into each actuarial firm's pension valuation software.

Our scope for performing the review did not include a complete replication of the valuation results as determined by Buck at June 30, 2020. Rather, we reviewed a number of sample test lives from Buck in great detail, and made our determinations as to whether the methods and assumptions being employed were being done so properly. We also reviewed the report in order to examine the aggregate results and conclusions of this actuarial valuation.

Though this approach is not intended to meet the rigors of a full scale replication of results – it still serves as a strong indicator of the appropriateness of the assumptions and methods being used to value the liabilities and determine the costs for these plans.

II. Process:

Our review process can be summarized as follows:

Computation: Valuation Liabilities

We analyzed test cases to compare the Actuarial Liability under the EAN funding method for the test cases of the JRS and NGNMRS Systems. As a starting point, we first replicate Buck test case liabilities by using their assumptions and methods to ensure that the computations were in sync with the descriptions listed in the valuation report.

When conducting an actuarial audit, and reviewing the testlives, we look at the projected benefits at each age for each decrement type. We also look at the component of the benefit (final average earnings and years of service). This is critical to understanding what the valuation system is actually valuing and making sure that the valuation is not "right for the wrong reasons", (meaning, errors could occur in two different directions making total liabilities approximate a correct value.)

We also review the construction of the commutation functions- the varying probabilities for each decrement and the discounting to the valuation date.

A more detailed analysis of the test lives we reviewed and our findings is shown in the next section.

Tying Test Lives to Total Liabilities

The basis of the audit is that the test lives reviewed tie directly to the liabilities being submitted in the valuation. As a result of learning of a discrepancy discovered a few years ago, we now request



that Buck also supply a list of every member with their total liability. We check that the total liability on the test life matches that from the larger group, and the larger group matches the total in the valuation report. That way we can be certain that the test life we review is directly tied to the final liabilities.

Actuarial Method:

Findings:

An actuarial cost method is a mathematical process for allocating the dollar amount of the total present value of plan benefits (PVB) between future normal costs and actuarial accrued liability (AAL). The retained actuary uses the Entry Age Normal actuarial cost method (EAN Method), characterized by:

- (1) Normal Cost the level percent of payroll contribution for JRS and level dollar contribution for NGNMRS, paid from each participant's date of hire to date of retirement, which will accumulate enough assets at retirement to fund the participant's projected benefits from retirement to death.
- (2) Actuarial Accrued Liability the assets which would have accumulated to date had contributions been made at the level of the normal cost since the date of the first benefit accrual, if all actuarial assumptions had been exactly realized, and there had been no benefit changes.

The EAN Method is the most prevalent funding method in the public sector. It is appropriate for the public sector because it produces costs that remain stable, either as a percentage of payroll or as a level dollar amount, over time, resulting in intergenerational equity for taxpayers and budget predictability. The recent Public Fund Survey included 199 retirement systems (mostly statewide). Over 82% of the plans reported using the EAN Method. Therefore, the retained actuary's stated funding methods for JRS and NGNMRS are certainly in line with national trends.

Application of Cost Method

In order to determine the normal cost as a level percentage of pay for JRS, the valuation must first determine the future compensation that each individual member is expected to receive over the course of their career (which is also the compensation used to generate contributions). The projection of the future compensation should be based on the salary that the participant is expected to receive according to the timing of the expected departures from active service (or, decrements). For NGNMRS, the method is similar, but based on a level dollar amount.

Conclusion:

For JRS, the level percent of pay method for both amortization of the unfunded accrued liability and the normal cost are both appropriate as a funding policy, considering that the payroll is not closed. For NGNMRS, the level dollar method for both amortization of the unfunded accrued liability and the normal cost are both appropriate as a funding policy since the benefits are not pay related.



SECTION 6

SAMPLE LIFE REVIEW



Sample Life Review

BACKGROUND

We reviewed sample test cases used for the June 30, 2020 valuation draft reports. In order to perform the review, we requested a number of sample cases from Buck. We combined this with our understanding of the plan provisions and reviewed the liability values produced by Buck for these sample cases only.

Note that the active test lives analyzed are not necessarily exposed to all of the possible benefits under the plans (i.e. already beyond the eligibility period for certain benefits, or not eligible for particular benefits). Therefore, findings may occur for these other benefits in future audits depending on the set of test lives chosen for review at that time. However, the vast majority of the liability for each plan is due to the retirement benefits (included for all active test lives), and retirement-related withdrawal benefits (one active test life included per plan), so any future findings are also expected to be de minimus. Also, the impact for any one test life may not be representative of the impact on the total plan.

When employing Buck's methods and assumptions, we matched the present value of benefits in total closely for the test cases submitted under the Pension plans for JRS and NGNMRS, and present value of retirement benefits under the JRS Retiree Health plan. In addition, we have analyzed the calculations of the ancillary benefits and have provided a summary of this detailed analysis at the end of this section. These exhibits provide a comparison of the calculations by decrement provided to us from Buck against our replication of those benefits as we interpret them from the plan provisions and assumptions.

In matching the present value of benefits, it is being determined that all benefits are being valued, and that the valuation of the liability for those benefits is consistent with the stated assumptions and methods.

FINDINGS

Pension Plan - JRS

For JRS pension, the test life PVB match was within 0.0% on the active test case shown. The retiree matches to within 0.0%. The deferred vested member matches to within 0.1%. This is considered a reasonable overall match for purposes of the valuation.

Early retirement factors (ERFs) are based on actuarial equivalence for the JRS DB plan, but it is not clear, based on Buck's valuation report, what actuarial assumptions are being used for the ERFs. We recommend Buck clarify the actuarial assumptions being used and disclose them appropriately in the JRS DB report.

We provided this finding to Buck and they clarified that these are older factors that have been grandfathered, since ERFs based on the more recently adopted actuarial assumptions produce lower benefit amounts. We still recommend Buck disclose the actuarial assumptions used for these ERFs in the appropriate section of the JRS report.



Retiree Health Plan - JRS

For JRS retiree health, the test life PVB match on the active test case was within 0.6%. The retiree matches to within 1.0%. The deferred vested member matches to within 3.2%. This would be considered as an overall match for purposes of the valuation.

We have surmised there are no significant issues to report for the Retiree Health Plan under JRS.

Pension Plan - NGNMRS

For NGNMRS pension, the test life PVB match was within 0.8% on the active test case shown. The retiree matches to within 4.6%. The deferred vested member matches to within 0.1%. For the active and deferred vested test cases, this would be considered as an overall match for purposes of the valuation.

The retiree test life did not match within a reasonable amount because Buck is currently assuming the death benefit for retirees is being valued using a \$1,200 annual benefit for everyone, including those who have an annual benefit amount other than the standard \$1,200, such as the test life we received. We provided this finding to Buck and they agreed it should be updated.

Buck estimated that updating for this would decrease the June 30, 2020 actuarial accrued liability for the NGNMRS plan by about \$38 thousand. This impact may be viewed as immaterial and, at the very least, be updated in future valuations, subject to the Actuarial Committee discretion.

NOTE

Ancillary or non-retirement benefits such as death and disability tend to be low probability events (and hence low liability) and they also tend to have many "bells and whistles" which can be valued in different ways by different actuaries. When looking at the test life results, it may be most informative to review the decrement (retirement, termination, disability, death) totals rather than each particular segment of the decrement (married non-occupational death, etc.). For all ancillary benefits comprising less than 0.1% of the total PVB for that individual, we checked the amounts for reasonableness, but did not always replicate.



Actuarial Review of Pension and Health Plans - June 30, 2020

Comparison of Present Value of Benefits - JRS

Actives	Test Case 1 - Pension					
Basic Data:						
Sex	Male					
Current Age	53.91					
Current Credited Service		17.28				
Present Value of Benefits (PVB)	GRS*	Buck	% Diff			
Retirement:						
Normal Retirement Benefit	1,103,126.30	1,103,126.25	0.0%			
Early Retirement Benefit	342,591.19	342,591.14	0.0%			
Total Retirement PVB	1,445,717.49	1,445,717.39	0.0%			
Disability:						
Disability Benefit	1,837.37	1,837.37	0.0%			
Disability Benefit < 2	-	-				
Total Disability PVB	1,837.37	1,837.37	0.0%			
<u>Death:</u>						
Married and Eligible	12,807.11	12,808.01	0.0%			
Married and Not Eligible	9,896.40	9,895.63	0.0%			
Single	571.86	573.79	-0.3%			
Death Benefit < 2	-	-				
Total Death PVB	23,275.36	23,277.43	0.0%			
<u>Withdrawal:</u>						
Nonvested	-	-				
Normal DV Benefit	18,286.80	18,286.80	0.0%			
Normal DV Death Benefit	-	-				
Total Withdrawal PVB	18,286.80	18,286.80	0.0%			
GRAND TOTAL PVB	1,489,117.03	1,489,118.99	0.0%			
	Test Case 1 - Health					
Present Value of Benefits (PVB)	GRS* Buck %					
Retirement:						
Benefit - Member	126,019.10	126,290.32	-0.2%			
Benefit - Spouse	146,760.68	148,013.46	-0.8%			
Post 65 Part D Contribution - Member	(15,414.26)	(15,468.50)	-0.4%			
Post 65 Part D Contribution - Spouse	(13,982.23)	(14,029.28)	-0.3%			
Total Retirement PVB	243,383.29	244,806.00	-0.6%			

Inactives - PVB	GRS*	Buck	% Diff
Retiree - Pension	1,907,266.60	1,907,266.60	0.0%
Retiree - Health	77,409.79	76,679.00	1.0%
Deferred Vested - Pension	686,193.38	686,967.00	-0.1%
Deferred Vested - Health	308,550.14	318,651.00	-3.2%
Total Retirement PVB	2,979,419.91	2,989,563.60	-0.3%

^{*} GRS' audit of Buck's calculation includes review of the benefit amounts, annuity values, assumptions and other factors related to the PVB calculation at each projected age. Differences may exist due to different interpretations of the statutes, as well as additional items as discussed throughout this audit report.



Actuarial Review of Pension and Health Plans - June 30, 2020

Comparison of Present Value of Benefits - JRS Pension & Health

JRS - Pension

Benefits - Buck Valuation Terminology	Description*
Retirement:	
Normal Retirement Benefit	Normal Retirement (base) Benefit
Early Retirement Benefit	Early Retirement (base) Benefit
Disability:	
Disability Benefit	Disability Benefit
Disability Benefit < 2	Disability Benefit for Employees With Less Than Two Years of Service
Death:	
Married and Eligible	Death Benefit for Married Participants Who are Eligible for Unreduced Benefits
Married and Not Eligible	Death Benefit for Married Participants Who are Not Eligible for Unreduced Benefits
Single	Refund of Contributions for Participants With no Beneficiary
Death Benefit < 2	Death (base) Benefit for Employees With Less Than Two Years of Service
Withdrawal:	
Nonvested	Nonvested Term Benefit
Normal DV Benefit	Normal Deferred Vested Benefit
Normal DV Death Benefit	Normal Deferred Vested Death benefit for Married Employees

JRS - Health

Benefits - Buck Valuation Terminology	Description*
Retirement:	
Pre 65 <member></member>	Base Benefit Paid to Employee While Employee is Under 65
Pre 65 <spouse></spouse>	Base Benefit Paid to Spouse While Employee is Under 65
Post 65 <member></member>	Base Benefit Paid to Employee While Employee is at Least 65
Post 65 <spouse></spouse>	Base Benefit Paid to Spouse While Employee is at Least 65
Post 65 Part D < Member >	Employee Post-Age 65 Medicare Part D Reimbursement
Post 65 Part D <spouse></spouse>	Spouse Post-Age 65 Medicare Part D Reimbursement
<u>Disability:</u>	
Pre 65 <member></member>	Base Benefit Paid to Disabled Employee While Employee is Under 65
Pre 65 <spouse></spouse>	Base Benefit Paid to Spouse of Disabled Employee While Employee is Under 65
Pre 65 Contribution <member></member>	Member Contributions Made While Employee is Under 65
Pre 65 Contribution <spouse></spouse>	Spouse Contributions Made While Employee is Under 65
Post 65 <member></member>	Base Benefit Paid to Disabled Employee While Employee is at Least 65
Post 65 <spouse></spouse>	Base Benefit Paid to Spouse of Disabled Employee While Employee is at Least 65
Post 65 Contribution < Member >	Member Contributions Made While Employee is at Least 65
Post 65 Contribution <spouse></spouse>	Spouse Contributions Made While Employee is at Least 65
Post 65 Part D < Member >	Disabled Employee Post-Age 65 Medicare Part D Reimbursement
Post 65 Part D <spouse></spouse>	Spouse of Disabled Employee Post-Age 65 Medicare Part D Reimbursement
Post 65 Part D Contribution < Member>	Member Reimbursement for Medicare Part D
Post 65 Part D Contribution <spouse></spouse>	Spouse Reimbursement for Medicare Part D
<u>Death:</u>	
Pre 65	Base Benefit Paid to Spouse While Employee would have been Under 65
Post 65	Base Benefit Paid to Spouse While Employee would have been at Least 65
Post 65 Part D	Spouse Post-Age 65 Medicare Part D Reimbursement
Withdrawal:	
Pre 65 <member></member>	Base Benefit Paid to Terminated Employee While Employee is Under 65
Pre 65 <spouse></spouse>	Base Benefit Paid to Spouse of Terminated Employee While Employee is Under 65
Post 65 <member></member>	Base Benefit Paid to Terminated Employee While Employee is at Least 65
Post 65 <spouse></spouse>	Base Benefit Paid to Spouse of Terminated Employee While Employee is at Least 65
Post 65 Part D < Member >	Terminated Employee Post-Age 65 Medicare Part D Reimbursement
Post 65 Part D <spouse></spouse>	Spouse of Terminated Employee Post-Age 65 Medicare Part D Reimbursement



Actuarial Review of Pension Plans - June 30, 2020

Comparison of Present Value of Benefits - NGNMRS

Actives	Test Case 1			
Basic Data:				
Sex	Male			
Current Age	29.38			
Current Credited Service	8.00			
Present Value of Benefits (PVB)	GRS	Buck	% Diff	Description*
Retirement:				<u>Retirement:</u>
Normal Retirement Benefit - LS	792.33	800.70	-1.0%	Normal Retirement (base) Benefit Payable if Lump Sum Elected
Normal Retirement Benefit - Annuity	330.56	332.31	-0.5%	Normal Retirement (base) Benefit Payable if Annuity Elected
Normal Retirement Benefit - Annuity - Death	19.51	19.51	0.0%	Base Benefit Payable to the Spouse if the Participant Elects the Annuity and Dies
Total Retirement PVB	1,142.40	1,152.52	-0.9%	
Disability:				<u>Disability:</u>
Disability Benefit - LS	7.19	7.19	0.0%	Disability Retirement Benefit Payable to the Participant if Lump Sum Elected
Disability Benefit - Annuity	2.62	2.62	0.0%	Disability Retirement Benefit Payable to the Participant if Annuity Elected
Disability Benefit - Annuity - Death	0.87	0.87	0.0%	Disability Benefit Payable to the Spouse if the Participant Elects the Annuity and Dies
Total Disability PVB	10.68	10.68	0.0%	
<u>Death:</u>				<u>Death:</u>
Death Benefit	57.75	57.92	-0.3%	Benefit Payable if the Participant Dies Before Retirement
Total Death PVB	57.75	57.92	-0.3%	
Withdrawal:				Withdrawal:
Term Benefit	-	-		Termination Benefit Payable to the Participant at Retirement
Total Withdrawal PVB	_	_	0.0%	
GRAND TOTAL PVB	1,210.84	1,221.12	-0.8%	

Inactives - PVB	GRS Buck		% Diff	
Retiree	3,621	3,795	-4.6%	
Deferred Vested	12,172	12,165	0.1%	

^{*} GRS' audit of Buck's calculation includes review of the benefit amounts, annuity values, assumptions and other factors related to the PVB calculation at each projected age.

Differences may exist due to different interpretations of the statutes, as well as additional items as discussed throughout this audit report.





REVIEW OF CONTRIBUTION RATE DETERMINATION

Review of Contribution Rate Determination

GRS was to analyze the funding method being used and verify its computation (as shown in page 8 of the JRS valuation report and page 5 of the NGNMRS valuation report). The goal here is to start with the Actuarial Accrued Liabilities and the Normal Costs that are developed from the data and valuation software and compare this to the assets in the system. The difference between the two, the Unfunded Actuarial Accrued Liability (UAAL) in conjunction with the Normal Cost forms the basis of the contributions that the actuary recommends the system make in order to ensure that benefits can be provided for current and future retirees.

FINDINGS

The calculations were reasonable and consistent with actuarial practice.

We recommend consideration of a longer period over which to amortize surpluses for NGNMRS. This could help manage rate volatility, which could be especially useful in a plan exhibiting data quality and volatility issues.





REVIEW OF ACTUARIAL VALUATION REPORT

Review of Actuarial Valuation Report

GRS reviewed the June 30, 2020 valuation reports for scope as well as content to determine if actuarial statistics were being reflected fairly and if the details of the plan were being correctly communicated. GRS did not review GASB 67/68/74/75 Accounting information, which was provided in a separate report.

In general, we consider the scope and content of Buck's report to be effective in communicating the financial position and contribution requirements of JRS and NGNMRS

We recommend the following for JRS:

• Disclose the actuarial assumptions used for the Early Retirement Factors.

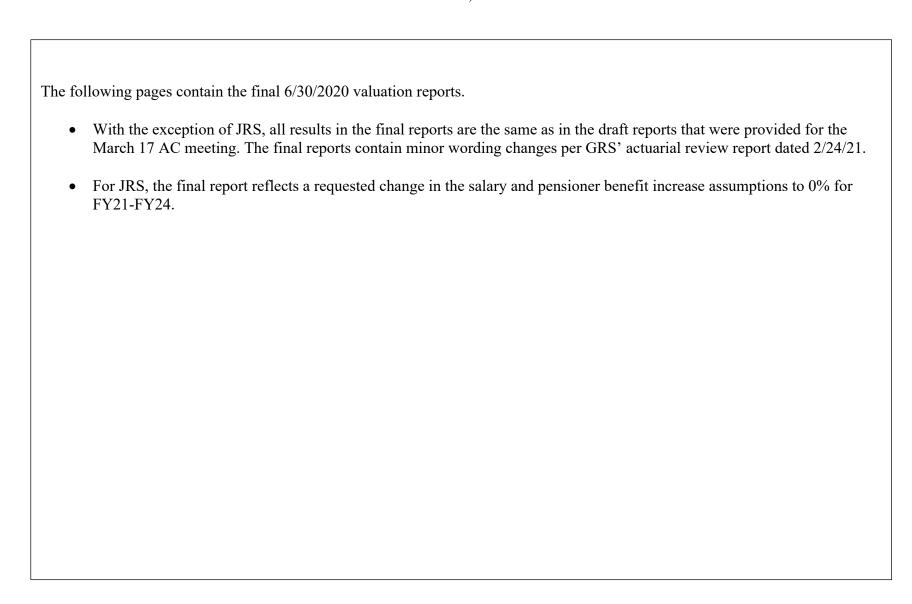
We recommend the following for NGNMRS:

- Disclose the actuarial equivalence assumptions in the either the plan provisions or assumptions sections.
- In the assumptions section, disclose the experience the assumptions are based on.
- List the counts/proportion of data being "imputed" by key elements (service, age, dates, etc...)



ACTUARIAL VALUATION REPORTS

Buck June 16, 2021



State of Alaska

Timeline for June 30, 2020 Valuations (PERS/TRS DB and DCR, JRS, NGNMRS)

Item		Original	Revised	Date	Team]
#	Task	Deadline	Deadline	Completed	Responsible	Comments / Notes
1	Enrollment Data Request to Aetna	7/15/20		7/9/20	Buck	Request was sent to Daniel Dudley at Aetna. Data received 7/20.
2	Valuation Data Request to DRB	7/17/20		7/17/20	Buck	
3	Monthly Audit Discussion with GRS / Buck	7/20/20	7/22/20	7/22/20	GRS / Buck	
4	Monthly Audit Discussion with GRS / Buck	8/17/20		not needed	GRS / Buck	
5	Preliminary 6/30/2020 Assets to Buck	8/19/20		8/10/20	DRB	These will be used only for the adoption of FY22 contribution rates.
6	Valuation Data to Buck	9/4/20		9/4/20	DRB	PERS/TRS/JRS data files received by Buck were forwarded to GRS on 9/17. NGNMRS data received on 10/20 (and forwarded to GRS on 10/23).
7	Audit Data and Sample Lives Request to Buck	9/15/20		9/18/20	GRS	
8	Actuarial Committee Meeting - FY22 Contribution Rates	9/16/20		9/16/20	All	
9	Monthly Audit Discussion with GRS / Buck	9/21/20		9/21/20	GRS / Buck	
10	Claims Data Request to Segal/DRB	9/25/20		8/27/20	Buck	To include claims through 6/30/20 that are paid through 8/31/20.
11	Data Questions to DRB	9/25/20		10/2/20	Buck	Data questions sent 9/29 (PERS), 10/2 (TRS/JRS), 11/19 (NGNMRS).
12	Final 6/30/2020 Assets to Buck	10/8/20	10/23/20	10/30/20	DRB	These will be used for the 6/30/20 valuations.
13	Data Answers to Buck	10/9/20		10/14/20	DRB	Responses to data questions received 10/12 (PERS), 10/13 (JRS), 10/14 (TRS), 12/8 (NGNMRS).
14	Monthly Audit Discussion with GRS / Buck	10/19/20	10/23/20	10/23/20	GRS / Buck	
15	TRS (and selected school districts in PERS) updated active listing at 10/1/20 to capture term/rehires since 6/30/20	10/19/20			DRB	Won't be reflected in 6/30/20 valuations, but DRB still wants Buck to track how many terms/rehires by plan.
16	Claims Data to Buck	10/21/20	9/21/20	10/5/20	Segal / DRB	Include claims through 6/30/20 that are paid through 8/31/20.
17	6/30/2020 Valuation Data and DRB Data Questions to GRS	10/30/20		11/5/20	Buck	Pension provided on 10/30; OPEB provided on 11/5. NGNMRS provided on 2/5.
18	Sample Life Information to GRS	11/6/20		11/12/20	Buck	Sample lives (other than JRS and OPEB) provided on 11/6; OPEB provided on 11/12; JRS provided on 11/13. NGNMRS provided on 2/5 (updated on 2/26).
19	Preliminary Valuation Results and PVB's by individual to GRS	11/13/20		11/13/20	Buck	PERS/TRS provided on 11/13. JRS provided on 12/10. NGNMRS provided on 2/26.
20	Monthly Audit Discussion with GRS / Buck	11/16/20		11/16/20	GRS / Buck	
21	Actuarial Committee Meeting - 6/30/20 valuation results (preliminary)	12/2/20		12/2/20	All	PERS, TRS, PERS DCR and TRS DCR only.
22	Monthly Audit Discussion with GRS / Buck	12/21/20		not needed	GRS / Buck	,
23	Draft DCR Valuation Reports to GRS	1/8/21		1/7/21	Buck	
24	Monthly Audit Discussion with GRS / Buck	1/18/21	1/20/21	1/20/21	GRS / Buck	
	Draft DB Valuation Reports to GRS	1/22/21		1/22/21	Buck	JRS provided on 2/23. NGNMRS provided on 2/26.
	Monthly Audit Discussion with GRS / Buck	2/15/21	2/17/21	2/17/21	GRS / Buck	
27	Draft Actuarial Review Report to Buck	2/28/21		2/26/21	GRS	GRS provided findings from their sample life review on 2/3 (no major issues were identifiedchanges to be reflected in 2021 valuations).
28	Monthly Audit Discussion with GRS / Buck	3/15/21		3/15/21	GRS / Buck	
29	Actuarial Committee Meeting - 6/30/20 valuation results (full) and draft valuation reports	3/17/21		3/17/21	All	JRS/NGNMRS valuation results and 2020 valuation baseline projections will also be provided.
30	Monthly Audit Discussion with GRS / Buck	4/19/21		not needed	GRS / Buck	
	Actuarial Committee Meeting - follow-up to March meeting (if needed)	4/29/21		not needed	All	
	Monthly Audit Discussion with GRS / Buck	5/17/21		5/17/21	GRS / Buck	
	Actuarial Committee Meeting - final valuation reports	6/16/21		1	All	Final valuation reports provided on 5/25.

Note: All deadline and completion dates are specific to PERS/TRS.



State of Alaska

Public Employees'
Retirement System

Actuarial Valuation Report As of June 30, 2020

May 2021



May 20, 2021

State of Alaska
The Alaska Retirement Management Board
The Department of Revenue, Treasury Division
The Department of Administration, Division of Retirement and Benefits
P.O. Box 110203
Juneau, AK 99811-0203

Certification of Actuarial Valuation

Dear Members of The Alaska Retirement Management Board, The Department of Revenue and The Department of Administration:

This report summarizes the annual actuarial valuation results of the State of Alaska Public Employees' Retirement System (PERS) as of June 30, 2020 performed by Buck Global, LLC (Buck). This report is an update to the draft report dated January 22, 2021, reflecting minor wording changes.

The actuarial valuation is based on financial information provided in the financial statements audited by KPMG LLP, member data provided by the Division of Retirement and Benefits, and medical enrollment data provided by the healthcare claims administrator (Aetna), as summarized in this report. The benefits considered are those delineated in Alaska statutes effective June 30, 2020. The actuary did not verify the data submitted, but did perform tests for consistency and reasonableness.

All costs, liabilities and other factors under PERS were determined in accordance with generally accepted actuarial principles and procedures. An actuarial cost method is used to measure the actuarial liabilities which we believe is reasonable. Buck is solely responsible for the actuarial data and actuarial results presented in this report. This report fully and fairly discloses the actuarial position of PERS as of June 30, 2020.

PERS is funded by Employer, State, and Member Contributions in accordance with the funding policy adopted by the Alaska Retirement Management Board (Board) and as required by Alaska state statutes. The funding objective for PERS is to pay required contributions that remain level as a percent of total PERS compensation. The Board has also established a funding policy objective that the required contributions be sufficient to pay the Normal Costs of active plan members, plan expenses, and amortize the Unfunded Actuarial Accrued Liability (UAAL) as a level percentage of total PERS compensation over a closed 25-year period as required by Alaska state statutes. The closed 25-year period was originally established effective June 30, 2014. Effective June 30, 2018, the Board adopted a 25-year layered UAAL amortization method as described in Section 5.2. The UAAL amortization continues to be on a level percent of pay basis. The compensation used to determine required contributions is the total compensation of all active members in PERS, including those hired after July 1, 2006 who are members of the Defined Contribution Retirement (DCR) Plan. This objective is currently being met and is projected to continue to be met. Absent future gains/losses, actuarially determined contributions are expected to remain level as a percent of pay and the overall funded status (on a combined pension/healthcare basis) is expected to increase to 100% in FY38.

The Board and staff of the State of Alaska may use this report for the review of the operations of PERS. Use of this report, for any other purpose or by anyone other than the Board or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, you should ask Buck to review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without the review by Buck.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. In particular, retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the plan and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience under the plan. The actuary performs an analysis of plan experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience. The last full experience analysis was performed for the period July 1, 2013 to June 30, 2017. Based on that experience study, the Board adopted new assumptions effective beginning with the June 30, 2018 valuation to better reflect expected future experience. Based on our annual analysis of recent claims experience, changes were made to the per capita claim cost rates effective June 30, 2020 to better reflect expected future healthcare experience. A summary of the actuarial assumptions and methods used in this actuarial valuation is shown in Sections 5.2 and 5.3. We certify that the assumptions and methods described in Sections 5.2 and 5.3 of this report meet the requirements of all applicable Actuarial Standards of Practice.

Governmental Accounting Standards Board (GASB) Statement No. 67 (GASB 67) was effective for PERS beginning with fiscal year ending June 30, 2014, and Statement No. 74 (GASB 74) was effective for PERS beginning with fiscal year ending June 30, 2017. Separate GASB 67 and GASB 74 reports as of June 30, 2020 have been prepared. We have also prepared the member data tables shown in Section 4 of this report for the Statistical Section of the CAFR, as well as the summary of actuarial assumptions and analysis of financial experience for the Actuarial Section of the CAFR. Please see our separate GASB 67 and GASB 74 reports for other information needed for the CAFR.

Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) applies to actuaries performing funding calculations related to a pension plan. ASOP 51 does not apply to actuaries performing services in connection with other post-employment benefits, such as medical benefits. Accordingly, ASOP 51 does not apply to the healthcare portion of PERS. See Section 6 of this report for further details regarding ASOP 51.

Use of Models

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under

the funding methods specified in this report. The output from the third-party vendor software is used as input to internally developed models that apply applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal models are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal models, extra checking and review are completed. Significant changes to the internal models that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

Additional models used in valuing health benefits are described later in the report.

COVID-19

The potential impact of the ongoing COVID-19 pandemic on costs and liabilities was considered and an adjustment was made in setting the medical per capita claims cost assumption. FY20 medical claims were adjusted for a COVID-19 related decline in claims during the last four months (March – June) of FY20. A more detailed explanation on these adjustments is shown in Section 5.2.

This report was prepared under my supervision and in accordance with all applicable Actuarial Standards of Practice. I am a Fellow of the Society of Actuaries, an Enrolled Actuary, a Fellow of the Conference of Consulting Actuaries, and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

I am available to discuss this report with you at your convenience. I can be reached at 602-803-6174.

Respectfully submitted,

0.LKL

David J. Kershner, FSA, EA, MAAA, FCA

Principal Buck

The undersigned actuary is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms his qualification to render opinions in such matters in accordance with the Qualification Standards of the American Academy of Actuaries.

Scott Young, FSA, EA, MAAA, FCA

Scott young

Director Buck

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Executive Summary

Overview

The State of Alaska Public Employees' Retirement System (PERS) provides pension and postemployment healthcare benefits to eligible participants. The Commissioner of the Department of Administration is responsible for administering the plan. The Alaska Retirement Management Board has fiduciary responsibility over the assets of the plan. This report presents the results of the actuarial valuation of PERS as of the valuation date of June 30, 2020.

Purpose

An actuarial valuation is performed on the plan annually as of the end of the fiscal year. The main purposes of the actuarial valuation detailed in this report are:

- 1. To determine the Employer/State contribution necessary to meet the Board's funding policy for the plan;
- 2. To disclose the funding assets and liability measures as of the valuation date;
- 3. To review the current funded status of the plan and assess the funded status as an appropriate measure for determining future actuarially determined contributions;
- 4. To compare actual and expected experience under the plan during the last fiscal year; and
- 5. To report trends in contributions, assets, liabilities, and funded status over the last several years.

The actuarial valuation provides a "snapshot" of the funded position of PERS based on the plan provisions, membership data, assets, and actuarial methods and assumptions as of the valuation date.

Actuarial projections are also performed to provide a long-term view of the expected future funded status and contribution patterns (see Section 3). The future funded status and contribution patterns would be different than those shown in Section 3 if future experience does not match the actuarial assumptions used in the projections.

Retiree group benefits models necessarily rely on the use of approximations and estimates, and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements.

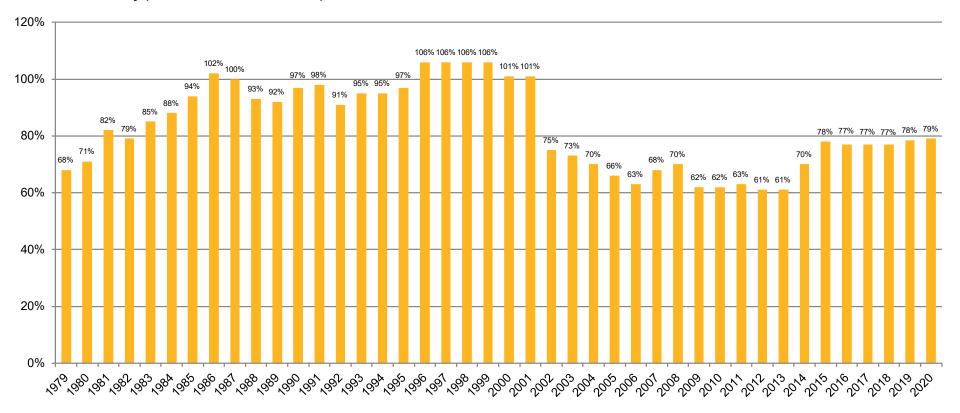
Funded Status

Where presented, references to "funded ratio" and "unfunded actuarial accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

1

Fund	ed Status as of June 30 (\$'s in 000's)		2019		2020
Pens	ion				
a.	Actuarial Accrued Liability	\$	15,039,180	\$	15,279,525
b.	Valuation Assets	Ψ	9,576,693	Ψ	9,713,710
Б. С.	Unfunded Actuarial Accrued Liability, (a) - (b)	\$	5,462,487	\$	5,565,815
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	Ψ	63.7%	Ψ	63.6%
и. е.	Fair Value of Assets	\$	9,489,405	\$	9,469,161
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	Ψ	63.1%	Ψ	62.0%
Healt	hcare				
a.	Actuarial Accrued Liability	\$	7,151,694	\$	7,036,550
b.	Valuation Assets	Ψ	7,810,491	Ψ	7,989,358
C.	Unfunded Actuarial Accrued Liability, (a) - (b)	\$	(658,797)	\$	(952,808)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	Ψ	109.2%	*	113.5%
e.	Fair Value of Assets	\$	7,767,692	\$	7,813,511
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	•	108.6%	•	111.0%
Total					
a.	Actuarial Accrued Liability	\$	22,190,874	\$	22,316,075
b.	Valuation Assets	*	17,387,184	*	17,703,068
C.	Unfunded Actuarial Accrued Liability, (a) - (b)	\$	4,803,690	\$	4,613,007
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	*	78.4%	•	79.3%
е.	Fair Value of Assets	\$	17,257,097	\$	17,282,672
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	*	77.8%	+	77.4%

Funded Ratio History (Based on Valuation Assets)



The key reasons for the change in the funded status are explained below. The funded status for healthcare benefits is not necessarily an appropriate measure to confirm that assets are sufficient to settle health plan obligations as there are no available financial instruments for purchase. Future experience is likely to vary from assumptions, so there is potential for actuarial gains or losses.

1. Investment Experience

The actuarial asset value was reinitialized to equal fair value of assets as of June 30, 2014. Beginning in FY15, the asset valuation method recognizes 20% of the investment gain or loss each year, for a period of five years. The FY20 investment return based on fair value of assets was approximately 4.1% compared to the expected investment return of 7.38% (net of investment expenses of approximately 0.29%). This resulted in a market asset loss of approximately \$556 million. Due to the recognition of investment gains and losses over a 5-year period, the FY20 investment return based on actuarial value of assets was approximately 5.8%, which resulted in an actuarial asset loss of approximately \$275 million.

2. Salary Increases

Salary increases for continuing active members during FY20 were less than expected based on the valuation assumptions, resulting in a liability gain of approximately \$11 million.

3. Demographic Experience

Section 4 provides statistics on active and inactive participants. The number of active participants decreased 9.2% from 12,152 at June 30, 2019 to 11,033 at June 30, 2020 due to active members exiting the plan during the year (due to retirement, termination, death, and disability) and the closure of the plan to new entrants as of July 1, 2006. The average age of active participants increased from 52.84 to 53.21 and average credited service increased from 17.80 to 18.38 years.

The number of benefit recipients increased 2.2% from 36,310 to 37,106 and their average age increased from 70.29 to 70.77. The number of vested terminated participants decreased 3.1% from 5,499 to 5,327. Their average age increased from 53.06 to 53.52.

The overall effect of the demographic experience during FY20 was a liability loss of approximately \$13.5 million (pension) and a liability gain of approximately \$27.61 million (healthcare).

4. COLA / PRPA Experience

The cost-of-living increases (COLA) for benefit recipients during FY20 were less than expected based on the valuation assumptions, resulting in a liability gain of approximately \$5 million. The postretirement pension adjustments (PRPA) were also less than expected, resulting in a liability gain of approximately \$74 million.

5. Retiree Medical Claims Experience

As described in Section 5.2, recent medical claims experience and changes in healthcare enrollment data provided to us for the June 30, 2020 valuation generated a liability gain of approximately \$280 million. The decrease in retired member contributions from CY20 to CY21 generated a liability loss of approximately \$1 million. Reduced claims during FY20, largely attributable to COVID-19, generated a liability gain of approximately \$26 million.

6. Changes in Methods Since the Prior Valuation

There were no changes in actuarial methods since the prior valuation.

¹ Includes the effects of changes in dependent coverage elections and Medicare Part B only experience.

7. Changes in Assumptions Since the Prior Valuation

Healthcare claim costs are updated annually as described in Section 5.2. Retired member contributions were updated to reflect the 5% decrease from CY20 to CY21. The amounts included in the Normal Cost for administrative expenses were updated based on the last two years of actual administrative expenses paid from plan assets. There were no other changes in actuarial assumptions since the prior valuation.

8. Changes in Benefit Provisions Since the Prior Valuation

There have been no changes in benefit provisions valued since the prior valuation.

Comparative Summary of Contribution Rates

Pens	ion	Actual FY 2022	Estimated FY 2023
a.	Normal Cost Rate Net of Member Contributions	2.58%	2.37%
b.	Past Service Cost Rate	<u>18.31%</u>	<u>18.53%</u>
C.	Total Employer/State Contribution Rate, (a) + (b), not less than (a) ¹	20.89%	20.90%
Healt	thcare	Actual FY 2022	Estimated FY 2023
a.	Normal Cost Rate	3.12%	2.84%
b.	Past Service Cost Rate	(1.80%)	(2.95%)
C.	Total Employer/State Contribution Rate, (a) + (b), not less than (a) ¹	3.12%	2.84%
Total		Actual FY 2022	Estimated FY 2023
a.	Normal Cost Rate Net of Member Contributions	5.70%	5.21%
b.	Past Service Cost Rate	<u>18.31%</u>	<u>18.53%</u>
C.	Total Employer/State Contribution Rate, (a) + (b) ¹	24.01%	23.74%
d.	Board Adopted Total Employer/State Contribution Rate	24.01%	TBD

Contribution rates are based on total (DB and DCR) payroll. The contribution rates shown above for FY23 are estimated assuming no actuarial gains/losses during FY21 and FY22. Actual FY23 contribution rates will be adopted by the Board in September 2021 reflecting FY21 asset experience.

6.10%

30.11%

Contribution rates include Employer contribution rates as limited by Alaska state statutes and the Additional State Contribution required under SB 125.

Defined Contribution Retirement (DCR) Rate Paid by Employers

Board Adopted Total Rate, Including DCR Rate Paid by Employers,

(d) + (e)

6.41%

TBD

Beginning with the June 30, 2014 valuation, contribution rates for FY17 and beyond are determined using new methodology in accordance with 2014 legislation under HB 385 and SB 119, 2014 Alaska Laws, which changed the amortization methodology to a closed 25-year period as a level percentage of pay, and eliminated the time lag on the contribution rate calculation by using a 2-year "roll-forward" approach assuming 0% population growth. Investment gains and losses are recognized over a 5-year period beginning in FY15. Beginning with the June 30, 2018 valuation, the UAAL amortization was changed as described in Section 5.2.

Summary of Actuarial Accrued Liability Gain/(Loss) and Other Changes During the Year

The following table summarizes the sources of change in the total Employer/State contribution rate as of June 30, 2019 and June 30, 2020 based on DB and DCR payroll combined:

		Pension	Healthcare	Total
1. Total Employer/State Contril	oution Rate as of June 30, 2019	20.17%	3.91%	24.08%
2. Change due to:				
a. Health Claims Experien	ce	N/A	(0.87)%	(0.87)%
b. Salary Increases		(0.03)%	N/A	(0.03)%
c. Investment Experience		0.44%	0.31%	0.75%
d. Demographic Experience	ce and Miscellaneous ¹	(0.19)%	0.38%	0.19%
e. Actual vs Expected Cor	ntributions	0.15%	(0.16)%	(0.01)%
f. Assumption Changes		0.00%	0.00%	0.00%
g. Total Change, (a) + (b)	+ (c) + (d) + (e) + (f)	0.37%	(0.34)%	0.03%
Total Employer/State Contril (1) + (2)(g)	oution Rate as of June 30, 2020,	20.54%	3.57%	24.11%

The following table shows the FY20 gain/(loss) on actuarial accrued liability as of June 30, 2020 (\$'s in 000's):

	Pension	Healthcare	Total
Retirement Experience	\$ (1,285)	\$ 4,857	\$ 3,572
Termination Experience	(4,857)	(8,049)	(12,906)
Disability Experience	(901)	867	(34)
Active Mortality Experience	4,182	(1,942)	2,240
Inactive Mortality Experience	(10,603)	2,098	(8,505)
Salary Increases	11,228	N/A	11,228
Rehires (Net of Rehire Load)	8,418	15,996	24,414
COLA Increases	4,618	N/A	4,618
PRPA Increases	74,177	N/A	74,177
Per Capita Claims Cost	N/A	278,796	278,796
COVID-19 Experience ²	N/A	25,856	25,856
Medicare Part B Only Experience	N/A	6,345	6,345
Changes in Dependent Coverage Elections	N/A	23,400	23,400
Programming Changes ³	1,406	N/A	1,406
Miscellaneous ⁴	4,429	<u>1,735</u>	6,164
Total	\$ 90,812	\$ 349,959	\$ 440,771

¹ Includes the effects of census data changes between the two valuations.

² Difference between actual and expected claims, largely attributable to COVD-19.

³ Includes adjustments to (a) the 75% PRPA for occupational disabilities to commence immediately, and (b) the mortality applied during the COLA deferral period for Tier 2 and Tier 3 members.

⁴ Includes the effects of various data changes that are typical when new census data is received for the annual valuation, the effects of the differences between expected and actual benefit payments, and other items that do not fit neatly into any of the other categories.

The rehire gain/(loss) amount shown on the previous page is the difference between (i) the increase in Actuarial Accrued Liability at June 30, 2020 due to rehires during the most recent plan year, and (ii) the load that was added to the June 30, 2019 Normal Cost based on the rehire load assumption used in the June 30, 2019 valuation. The development of the FY20 rehire gain/(loss) amount is shown in the table below (\$'s in 000's):

	Pension	Healthcare	Total
Increase/(Decrease) in Actuarial Accrue at June 30, 2020 due to Rehires	ed Liability \$ 15,604	\$ (2,208)	\$ 13,396
June 30, 2019 Normal Cost Rehire Load interest to June 30, 2020	d, with \$ 24,022	\$ 13,788	\$ 37,810
3. Rehire Gain/(Loss), (2) - (1)	\$ 8,418	\$ 15,996	\$ 24,414

Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost (\$'s in 000's)

Peace Officer / Firefighter

As of June 30, 2020	Present Value of Projected Benefits			arial Accrued ast Service) Liability	
Active Members					
Retirement Benefits	\$	910,930	\$	804,294	
Termination Benefits		11,914		3,012	
Disability Benefits		1,623		(1,092)	
Death Benefits		9,747		6,259	
Return of Contributions		1,488		(4,535)	
Medical and Prescription Drug Benefits		381,738		322,960	
Medicare Part D Subsidy		(29,887)		(25,342)	
Indebtedness		(4,523)	(4,		
Subtotal	\$	1,283,030	\$	1,101,033	
Inactive Members					
Not Vested	\$	2,182	\$	2,182	
Vested Terminations					
- Retirement Benefits		36,707		36,707	
- Medical and Prescription Drug Benefits		94,212		94,212	
- Medicare Part D Subsidy		(8,751)		(8,751)	
- Indebtedness		(456)		(456)	
Retirees & Beneficiaries					
- Retirement Benefits		1,649,532		1,649,532	
- Medical and Prescription Drug Benefits		565,479		565,479	
- Medicare Part D Subsidy		(70,192)		(70,192)	
Subtotal	\$	2,268,713	\$	2,268,713	
Total	\$	3,551,743	\$	3,369,746	
Total Pension	\$	2,619,144	\$	2,491,380	
Total Medical, Net of Part D Subsidy	\$	932,599	\$	878,366	
Total Medical, Gross of Part D Subsidy	\$ 1,041,429			982,651	

Peace Officer / Firefighter

As of June 30, 2020	Present Value of Projected Benefits		Actuarial Accrued (Past Service) Liability	
By Tier				
Tier 1				
- Pension	\$	1,024,529	\$	1,023,595
- Medical, Net of Part D Subsidy		289,357	·	288,756
Tier 2		·		·
- Pension		681,171		666,070
- Medical, Net of Part D Subsidy		265,578		259,844
Tier 3				
- Pension		913,444		801,715
- Medical, Net of Part D Subsidy		377,664		329,766
Total	\$	3,551,743	\$	3,369,746
As of June 30, 2020			No	ormal Cost
Active Members				
Retirement Benefits			\$	19,111
Termination Benefits				1,657
Disability Benefits				504
Death Benefits				667
Return of Contributions				1,101
Medical and Prescription Drug Benefits				10,290
Medicare Part D Subsidy				(817)
Rehire Assumption (Pension)				4,325
Rehire Assumption (Medical)				1,619
Administrative Expenses (Pension)				1,514
Administrative Expenses (Medical)				685
Total			\$	40,656
Total Pension			\$	28,879
Total Medical, Net of Part D Subsidy			\$	11,777
Total Medical, Gross of Part D Subsidy			\$	12,594
By Tier				
Tier 1				
- Pension			\$	403
- Medical, Net of Part D Subsidy				268
Tier 2				
- Pension				4,680
- Medical, Net of Part D Subsidy				1,722
Tier 3				
- Pension				23,796
- Medical, Net of Part D Subsidy				9,787
Total			\$	40,656

Section 1.1: Actuarial Liabilities and Normal Cost (\$'s in 000's)

Others

As of June 30, 2020		sent Value of ected Benefits	Actuarial Accrued (Past Service) Liability		
Active Members					
Retirement Benefits	\$	3,493,134	\$	3,166,630	
Termination Benefits		229,771		129,112	
Disability Benefits		18,314		5,330	
Death Benefits		48,513		37,843	
Return of Contributions		15,235		(31,403)	
Medical and Prescription Drug Benefits		2,008,284		1,628,239	
Medicare Part D Subsidy		(234,813)		(195,996)	
Indebtedness		(42,238)		(42,238)	
Subtotal	\$	5,536,200	\$	4,697,517	
Inactive Members					
Not Vested	\$	72,950	\$	72,950	
Vested Terminations					
- Retirement Benefits		639,590		639,590	
- Medical and Prescription Drug Benefits		943,124		943,124	
- Medicare Part D Subsidy		(95,182)		(95,182)	
- Indebtedness		(12,603)		(12,603)	
Retirees & Beneficiaries					
- Retirement Benefits		8,822,934		8,822,934	
- Medical and Prescription Drug Benefits		4,541,099		4,541,099	
- Medicare Part D Subsidy		(663,100)		(663,100)	
Subtotal	\$	14,248,812	\$	14,248,812	
Total	\$	19,785,012	\$	18,946,329	
Total Pension	\$	13,285,600	\$	12,788,145	
Total Medical, Net of Part D Subsidy	\$	6,499,412	\$	6,158,184	
Total Medical, Gross of Part D Subsidy	\$ 7,492,507		\$	7,112,462	

Others

As of June 30, 2020	Present Value of Projected Benefits			arial Accrued ast Service) Liability
By Tier				
Tier 1				
- Pension	\$	6,221,260	\$	6,190,548
- Medical, Net of Part D Subsidy		2,523,052		2,493,840
Tier 2				
- Pension		3,753,099		3,647,096
- Medical, Net of Part D Subsidy		1,929,059		1,854,613
Tier 3				
- Pension		3,311,241		2,950,501
- Medical, Net of Part D Subsidy		2,047,301		1,809,731
Total	\$	19,785,012	\$	18,946,329
As of June 30, 2020			N	ormal Cost
Active Members				
Retirement Benefits			\$	59,753
Termination Benefits				15,548
Disability Benefits				2,123
Death Benefits				1,912
Return of Contributions				7,577
Medical and Prescription Drug Benefits				65,545
Medicare Part D Subsidy				(6,788)
Rehire Assumption (Pension)				16,314
Rehire Assumption (Medical)				10,042
Administrative Expenses (Pension)				5,709
Administrative Expenses (Medical)				4,249
Total			\$	181,984
Total Pension			\$	108,936
Total Medical, Net of Part D Subsidy			\$	73,048
Total Medical, Gross of Part D Subsidy			\$	79,836
By Tier				
Tier 1				
- Pension			\$	10,986
- Medical, Net of Part D Subsidy				10,177
Tier 2				
- Pension				27,012
- Medical, Net of Part D Subsidy				18,171
Tier 3				
- Pension				70,938
- Medical, Net of Part D Subsidy				44,700
Total			\$	181,984

Section 1.1: Actuarial Liabilities and Normal Cost (\$'s in 000's)

All Members

As of June 30, 2020	Present Value of Projected Benefits			Actuarial Accrued (Past Service) Liability		
Active Members						
Retirement Benefits	\$	4,404,064	\$	3,970,924		
Termination Benefits		241,685		132,124		
Disability Benefits		19,937		4,238		
Death Benefits		58,260		44,102		
Return of Contributions		16,723		(35,938)		
Medical and Prescription Drug Benefits		2,390,022		1,951,199		
Medicare Part D Subsidy		(264,700)		(221,338)		
Indebtedness		(46,761)		(46,761)		
Subtotal	\$	6,819,230	\$	5,798,550		
Inactive Members						
Not Vested	\$	75,132	\$	75,132		
Vested Terminations						
- Retirement Benefits		676,297		676,297		
- Medical and Prescription Drug Benefits		1,037,336		1,037,336		
- Medicare Part D Subsidy		(103,933)		(103,933)		
- Indebtedness		(13,059)		(13,059)		
Retirees & Beneficiaries						
- Retirement Benefits		10,472,466		10,472,466		
- Medical and Prescription Drug Benefits		5,106,578		5,106,578		
- Medicare Part D Subsidy		(733,292)		(733,292)		
Subtotal	\$	16,517,525	\$	16,517,525		
Total	\$	23,336,755	\$	22,316,075		
Total Pension	\$	15,904,744	\$	15,279,525		
Total Medical, Net of Part D Subsidy	\$	7,432,011	\$	7,036,550		
Total Medical, Gross of Part D Subsidy	\$ 8,533,936		\$	8,095,113		

All Members

As of June 30, 2020	Present Value of Projected Benefits		Actuarial Accru (Past Service Liability	
By Tier				
Tier 1				
- Pension	\$	7,245,789	\$	7,214,143
- Medical, Net of Part D Subsidy		2,812,409		2,782,596
Tier 2				
- Pension		4,434,270		4,313,166
- Medical, Net of Part D Subsidy		2,194,637		2,114,457
Tier 3				
- Pension		4,224,685		3,752,216
- Medical, Net of Part D Subsidy		2,424,965		2,139,497
Total	\$	23,336,755	\$	22,316,075
As of June 30, 2020			N	ormal Cost
Active Members				
Retirement Benefits			\$	78,864
Termination Benefits				17,205
Disability Benefits				2,627
Death Benefits				2,579
Return of Contributions				8,678
Medical and Prescription Drug Benefits				75,835
Medicare Part D Subsidy				(7,605)
Rehire Assumption (Pension)				20,639
Rehire Assumption (Medical)				11,661
Administrative Expenses (Pension)				7,223
Administrative Expenses (Medical)				4,934
Total			\$	222,640
Total Pension			\$	137,815
Total Medical, Net of Part D Subsidy			\$	84,825
Total Medical, Gross of Part D Subsidy			\$	92,430
By Tier				
Tier 1				
- Pension			\$	11,389
- Medical, Net of Part D Subsidy				10,445
Tier 2				
- Pension				31,692
- Medical, Net of Part D Subsidy				19,893
Tier 3				
- Pension				94,734
- Medical, Net of Part D Subsidy				54,487
Total			\$	222,640

Section 1.2: Actuarial Contributions as of June 30, 2020 (\$'s in 000's)

Peace Officer / Firefighter

Normal Cost Rate	Pension		Healthcare		Total	
1. Total Normal Cost	\$	28,879	\$	11,777	\$	40,656
2. DB Rate Payroll Projected for FY21		159,555		159,555		159,555
3. DCR Rate Payroll Projected for FY21		203,314		203,314		203,314
4. Total Rate Payroll Projected for FY21		362,869		362,869		362,869
5. Normal Cost Rate						
a. Based on DB Rate Payroll, (1) ÷ (2)		18.10%		7.38%		25.48%
b. Based on Total Rate Payroll, (1) ÷ (4)		7.96%		3.25%		11.20%
6. Average Member Contribution Rate		3.30%		0.00%		3.30%
7. Employer Normal Cost, (5)(b) - (6)		4.66%		3.25%		7.90%

Past Service Rate	Pension		Healthcare		Total
Actuarial Accrued Liability	\$	2,491,380	\$	878,366	\$ 3,369,746
2. Valuation Assets ¹		1,583,854		997,304	2,581,158
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$	907,526	\$	(118,938)	\$ 788,588
4. Funded Ratio, (2) ÷ (1)		63.6%		113.5%	76.6%
5. Past Service Cost Amortization Payment		67,273		(8,061)	59,212
6. Total Rate Payroll Projected for FY21		362,869		362,869	362,869
7. Past Service Rate, (5) ÷ (6)		18.54%		(2.22%)	18.54%
Total Employer / State Contribution Rate, not less than Normal Cost Rate		23.20%		3.25%	26.45%
Normal Cost Rate by Tier (Total Employer and Me	ember) ²				
Tier 1		20.26%		13.47%	33.73%
Tier 2		17.69%		6.51%	24.20%
Tier 3		18.15%		7.46%	25.61%

¹ Allocated between Peace Officer / Firefighter and Others in proportion to Actuarial Accrued Liability.

² Rates determined considering the payroll for members in each tier. DCR payroll is excluded from these calculations.

Peace Officer / Firefighter

Schedule of Past Service Cost Amortizations - Pension (\$'s in 000's)

	Amortizat	Amortization Period			Balances					
Layer	Date Created	Years Remaining	Initial		Outstanding		_	inning-of- r Payment		
Initial Amount	6/30/2018	19	\$	731,232	\$	725,301	\$	55,139		
Change in Assumptions	6/30/2018	23		88,162		88,810		6,010		
FY19 Loss	6/30/2019	24		61,980		62,257		4,112		
FY20 Loss	6/30/2020	25		31,158		31,158		2,012		
Total					\$	907,526	\$	67,273		

Schedule of Past Service Cost Amortizations - Healthcare (\$'s in 000's)

	Amortization Period			Bala				
Layer	Date Created	Years Remaining			Initial Outstanding		Beginning-of Year Paymer	
Initial Amount	6/30/2018	19	\$	(30,991)	\$	(30,740)	\$	(2,337)
Change in Assumptions/Methods/EGWP	6/30/2018	23		27,556		27,759		1,879
FY19 Gain	6/30/2019	24		(77,575)		(77,921)		(5,147)
FY20 Gain	6/30/2020	25		(38,036)		(38,036)		(2,456)
Total					\$	(118,938)	\$	(8,061)

Schedule of Past Service Cost Amortizations - Total (\$'s in 000's)

	Amortizat		Bala	s				
Layer	Date Created	Years Remaining	Initial		Οι	itstanding	Beginning-of- Year Payment	
Initial Amount	6/30/2018	19	\$	700,241	\$	694,561	\$	52,802
Change in Assumptions/Methods/EGWP	6/30/2018	23		115,718		116,569		7,889
FY19 Gain	6/30/2019	24		(15,595)		(15,664)		(1,035)
FY20 Gain	6/30/2020	25		(6,878)		(6,878)		(444)
Total					\$	788,588	\$	59,212

Section 1.2: Actuarial Contributions as of June 30, 2020 (\$'s in 000's)

Others

Normal Cost Rate	Pension Heal		lealthcare	Total
1. Total Normal Cost	\$ 108,936	\$	73,048	\$ 181,984
2. DB Rate Payroll Projected for FY21	770,506		770,506	770,506
3. DCR Rate Payroll Projected for FY21	1,239,703		1,239,703	1,239,703
4. Total Rate Payroll Projected for FY21	2,010,209		2,010,209	2,010,209
5. Normal Cost Rate				
a. Based on DB Rate Payroll, (1) ÷ (2)	14.14%		9.48%	23.62%
b. Based on Total Rate Payroll, (1) ÷ (4)	5.42%		3.63%	9.05%
6. Average Member Contribution Rate	2.62%		0.00%	2.62%
7. Employer Normal Cost, (5)(b) - (6)	2.80%		3.63%	6.43%

Past Service Rate		Pension	ŀ	lealthcare	Total
Actuarial Accrued Liability	\$	12,788,145	\$	6,158,184	\$ 18,946,329
2. Valuation Assets ¹		8,129,856		6,992,054	15,121,910
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$	4,658,289	\$	(833,870)	\$ 3,824,419
4. Funded Ratio, (2) ÷ (1)		63.6%		113.5%	79.8%
5. Past Service Cost Amortization Payment		346,776		(55,136)	291,640
6. Total Rate Payroll Projected for FY21		2,010,209		2,010,209	2,010,209
7. Past Service Rate, (5) ÷ (6)		17.25%		(2.74%)	17.25%
Total Employer / State Contribution Rate, not less than Normal Cost Rate		20.05%		3.63%	23.68%
Normal Cost Rate by Tier (Total Employer and Me	mber) ²	!			
Tier 1		17.82%		16.51%	34.33%
Tier 2		13.22%		8.89%	22.11%
Tier 3		14.06%		8.86%	22.92%

¹ Allocated between Peace Officer / Firefighter and Others in proportion to Actuarial Accrued Liability.

² Rates determined considering the payroll for members in each tier. DCR payroll is excluded from these calculations.

Others

Schedule of Past Service Cost Amortizations - Pension (\$'s in 000's)

	Amortizat	ion Period	Bala		
Layer	Date Created	Years Remaining	Initial	Outstanding	inning-of- r Payment
Initial Amount	6/30/2018	19	\$ 3,889,167	\$ 3,857,623	\$ 293,264
Change in Assumptions	6/30/2018	23	467,280	470,714	31,856
FY19 Loss	6/30/2019	24	235,559	236,609	15,629
FY20 Loss	6/30/2020	25	93,343	93,343	 6,027
Total				\$ 4,658,289	\$ 346,776

Schedule of Past Service Cost Amortizations - Healthcare (\$'s in 000's)

	Amortization Period			Bala	S		
Layer	Date Created	Years Remaining	Initial		Outstanding		 inning-of- r Payment
Initial Amount	6/30/2018	19	\$	(47,263)	\$	(46,880)	\$ (3,564)
Change in Assumptions/Methods/EGWP	6/30/2018	23		22,293		22,456	1,519
FY19 Gain	6/30/2019	24		(553,265)		(555,735)	(36,708)
FY20 Gain	6/30/2020	25		(253,711)		(253,711)	 (16,383)
Total					\$	(833,870)	\$ (55,136)

Schedule of Past Service Cost Amortizations - Total (\$'s in 000's)

	Amortization Period			Bala			
Layer	Date Created	Years Remaining	Initial		Outstanding		ginning-of- ar Payment
Initial Amount	6/30/2018	19	\$	3,841,904	\$	3,810,743	\$ 289,700
Change in Assumptions/Methods/EGWP	6/30/2018	23		489,573		493,170	33,375
FY19 Gain	6/30/2019	24		(317,706)		(319,126)	(21,079)
FY20 Gain	6/30/2020	25		(160,368)		(160,368)	 (10,356)
Total					\$	3,824,419	\$ 291,640

Section 1.2: Actuarial Contributions as of June 30, 2020 (\$'s in 000's)

All Members

Normal Cost Rate	Pension	nsion Healthcare		Total
1. Total Normal Cost	\$ 137,815	\$	84,825	\$ 222,640
2. DB Rate Payroll Projected for FY21	930,061		930,061	930,061
3. DCR Rate Payroll Projected for FY21	1,443,017		1,443,017	1,443,017
4. Total Rate Payroll Projected for FY21	2,373,078		2,373,078	2,373,078
5. Normal Cost Rate				
a. Based on DB Rate Payroll, (1) ÷ (2)	14.82%		9.12%	23.94%
b. Based on Total Rate Payroll, (1) ÷ (4)	5.81%		3.57%	9.38%
6. Average Member Contribution Rate ¹	2.72%		0.00%	2.72%
7. Employer Normal Cost, (5)(b) - (6)	3.09%		3.57%	6.66%

Past Service Rate		Pension	ŀ	lealthcare	Total
Actuarial Accrued Liability	\$	15,279,525	\$	7,036,550	\$ 22,316,075
2. Valuation Assets		9,713,710		7,989,358	17,703,068
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$	5,565,815	\$	(952,808)	\$ 4,613,007
4. Funded Ratio, (2) ÷ (1)		63.6%		113.5%	79.3%
5. Past Service Cost Amortization Payment		414,049		(63,197)	350,852
6. Total Rate Payroll Projected for FY21		2,373,078		2,373,078	2,373,078
7. Past Service Rate, (5) ÷ (6)		17.45%		(2.66%)	17.45%
Total Employer / State Contribution Rate, not less than Normal Cost Rate		20.54%		3.57%	24.11%
Normal Cost Rate by Tier (Total Employer and Me	mber) ²	2			
Tier 1		17.90%		16.41%	34.31%
Tier 2		13.73%		8.62%	22.35%
Tier 3		14.91%		8.57%	23.48%

¹ 7.5% for Peace Officer / Firefighter and 6.82% weighted average for Others

 $^{^{2}}$ Rates determined considering the payroll for members in each tier. DCR payroll is excluded from these calculations.

All Members

Schedule of Past Service Cost Amortizations - Pension (\$'s in 000's)

	Amortizat	tion Period	Bala		
Layer	Date Created	Years Remaining	Initial	Outstanding	inning-of- r Payment
Initial Amount	6/30/2018	19	\$ 4,620,399	\$ 4,582,924	\$ 348,403
Change in Assumptions	6/30/2018	23	555,442	559,524	37,866
FY19 Loss	6/30/2019	24	297,539	298,866	19,741
FY20 Loss	6/30/2020	25	124,501	124,501	 8,039
Total				\$ 5,565,815	\$ 414,049

Schedule of Past Service Cost Amortizations - Healthcare (\$'s in 000's)

	Amortization Period			Bala			
Layer	Date Created	Years Remaining	Initial		Outstanding		inning-of- r Payment
Initial Amount	6/30/2018	19	\$	(78,254)	\$	(77,620)	\$ (5,901)
Change in Assumptions/Methods/EGWP	6/30/2018	23		49,849		50,215	3,398
FY19 Gain	6/30/2019	24		(630,840)		(633,656)	(41,855)
FY20 Gain	6/30/2020	25		(291,747)	_	(291,747)	 (18,839)
Total					\$	(952,808)	\$ (63,197)

Schedule of Past Service Cost Amortizations - Total (\$'s in 000's)

	Amortization Period			Bala	nce	es	
Layer	Date Created	Years Remaining		Initial	0	utstanding	ginning-of- ar Payment
Initial Amount	6/30/2018	19	\$	4,542,145	\$	4,505,304	\$ 342,502
Change in Assumptions/Methods/EGWP	6/30/2018	23		605,291		609,739	41,264
FY19 Gain	6/30/2019	24		(333,301)		(334,790)	(22,114)
FY20 Gain	6/30/2020	25		(167,246)	_	(167,246)	 (10,800)
Total					\$	4,613,007	\$ 350,852

Section 1.3: Roll-Forward Contribution Rate Calculation for FY23 (\$'s in 000's)

	Pension	Healthcare	Total
Liability Roll Forward			
a. Actuarial Accrued Liability as of June 30, 2020	\$ 15,279,525	\$ 7,036,550	\$ 22,316,075
b. Normal Cost	130,592	79,891	210,483
c. Interest on (a) and (b) at 7.38%	1,137,267	525,193	1,662,460
d. Estimated Benefit Payments	(944,242)	(408,057)	(1,352,299)
e. Interest on (d) at 7.38%, adjusted for timing	(37,130)	(14,789)	(51,919)
f. Expected Actuarial Accrued Liability as of June 30, 2021	\$ 15,566,012	\$ 7,218,788	\$ 22,784,800
g. Projected Normal Cost	117,140	71,782	188,922
h. Interest on (f) and (g) at 7.38%	1,157,417	538,044	1,695,461
i. Estimated Benefit Payments	(992,490)	(428,722)	(1,421,212)
j. Interest on (i) at 7.38%, adjusted for timing	(39,027)	(15,538)	(54,565)
k. Expected Actuarial Accrued Liability as of June 30, 2022	\$ 15,809,052	\$ 7,384,354	\$ 23,193,406
2. Asset Roll Forward			
a. Actuarial Value of Assets as of June 30, 2020	\$ 9,713,710	\$ 7,989,358	\$ 17,703,068
b. Interest on (a) at 7.38%	716,872	589,615	1,306,487
c. Employee Contributions	70,747	0	70,747
d. Employer Contributions	285,481	96,110	381,591
e. State Assistance Contributions	203,585	0	203,585
f. Interest on (c) thru (e) at 7.38%, adjusted for timing*	27,935	3,483	31,418
g. Estimated Benefit Payments	(944,242)	(408,057)	(1,352,299)
h. Administrative Expenses	(7,223)	(4,934)	(12,157)
i. Interest on (g) and (h) at 7.38%, adjusted for timing	(37,391)	(14,968)	(52,359)
j. AVA Adjustments	(25,173)	(7,721)	(32,894)
k. Expected Actuarial Value of Assets as of June 30, 2021	\$ 10,004,301	\$ 8,242,886	\$ 18,247,187
I. Interest on (k) at 7.38%	738,317	608,325	1,346,642
m. Employee Contributions	65,590	0	65,590
n. Employer Contributions	305,011	74,463	379,474
o. State Assistance Contributions**	193,494	0	193,494
p. Interest on (m) thru (o) at 7.38%, adjusted for timing*	27,712	2,699	30,411
q. Estimated Benefit Payments	(992,490)	(428,722)	(1,421,212)
r. Administrative Expenses	(6,531)	(4,466)	(10,997)
s. Interest on (q) and (r) at 7.38%, adjusted for timing	(39,264)	(15,700)	(54,964)
t. AVA Adjustments	(103,367)	(76,343)	(179,710)
u. Expected Actuarial Value of Assets as of June 30, 2022	\$ 10,192,773	\$ 8,403,142	\$ 18,595,915
3. Expected Unfunded Actuarial Accrued Liability as of June 30, 2022, 1(k) - 2(u)	\$ 5,616,279	\$ (1,018,788)	\$ 4,597,491

^{*} Employee and Employer Contributions are paid throughout the year. State Assistance Contributions are assumed to be paid on July 1, 2020 for FY21, and July 1, 2021 for FY22.

^{**} The FY22 State Assistance Contribution is expected to be contributed 100% to pension.

		Pension	Н	ealthcare	Total
4. Expected Annual Rate Payroll for FY23					
a. Defined Benefit Members					\$ 774,572
b. Defined Contribution Retirement Members					 1,630,504
c. Total Rate Payroll					\$ 2,405,076
5. Expected FY23 Contribution Rate Calculation					
a. Projected Normal Cost for FY23	\$	110,560	\$	68,351	\$ 178,911
b. Projected Normal Cost Rate for FY23		4.60%		2.84%	7.44%
c. Expected Member Contribution Rate for FY23		(2.23%)		0.00%	(2.23%)
d. Expected Employer Normal Cost Rate for FY23		2.37%		2.84%	5.21%
e. Expected Unfunded Liability as of June 30, 2022	\$	5,616,279	\$	(1,018,788)	\$ 4,597,491
f. FY23 Layered Amortization of Expected Unfunded Liabilit	ty	445,759		(70,873)	374,886
g. Expected Past Service Cost Contribution Rate for FY	23	18.53%		(2.95%)	18.53%
h. Expected Total Contribution Rate for FY23, not less than Normal Cost Rate		20.90%		2.84%	23.74%

The components of the expected FY23 amortization amounts are shown below (totals may not add due to rounding):

Expected FY23 Schedule of Past Service Cost Amortizations - Pension (\$'s in 000's)

	Amortizat	Amortization Period Bala		ances	
Layer	Date Created	Years Remaining at 6/30/22	Initial	Outstanding at 6/30/22	Beginning-of- Year Payment for FY23
Initial Amount	6/30/2018	17	\$ 4,620,399	\$ 4,498,197	\$ 367,828
Change in Assumptions	6/30/2018	21	555,442	559,718	39,977
FY19 Loss	6/30/2019	22	297,539	300,063	20,841
FY20 Loss	6/30/2020	23	124,501	125,417	8,488
Expected FY21 Loss	6/30/2021	24	29,744	29,876	1,973
Expected FY22 Loss	6/30/2022	25	103,008	103,008	6,652
Total				\$ 5,616,279	\$ 445,759

Expected FY23 Schedule of Past Service Cost Amortizations - Healthcare (\$'s in 000's)

	Amortization Period		Balances				
Layer	Date Created	Years Remaining at 6/30/22	Initial		itstanding it 6/30/22	Ye	ginning-of- ar Payment for FY23
Initial Amount	6/30/2018	17	\$ (78,254)	\$	(76,185)	\$	(6,230)
Change in Assumptions/Methods/EGWP	6/30/2018	21	49,849		50,232		3,588
FY19 Gain	6/30/2019	22	(630,840)		(636,194)		(44,188)
FY20 Gain	6/30/2020	23	(291,747)		(293,891)		(19,889)
Expected FY21 Gain	6/30/2021	24	(68,832)		(69,140)		(4,567)
Expected FY22 Loss	6/30/2022	25	6,390		6,390		413
Total				\$	(1,018,788)	\$	(70,873)

Expected FY23 Schedule of Past Service Cost Amortizations - Total (\$'s in 000's)

	Amortization Period		Bala	nces	
Layer	Date Created	Years Remaining at 6/30/22	Initial	Outstanding at 6/30/22	Beginning-of- Year Payment for FY23
Initial Amount	6/30/2018	17	\$ 4,542,145	\$ 4,422,012	\$ 361,598
Change in Assumptions/Methods/EGWP	6/30/2018	21	605,291	609,950	43,565
FY19 Gain	6/30/2019	22	(333,301)	(336,131)	(23,347)
FY20 Gain	6/30/2020	23	(167,246)	(168,474)	(11,401)
Expected FY21 Gain	6/30/2021	24	(39,088)	(39,264)	(2,594)
Expected FY22 Loss	6/30/2022	25	109,398	109,398	7,065
Total				\$ 4,597,491	\$ 374,886

Section 1.4: Actuarial Gain/(Loss) for FY20 (\$'s in 000's)

	Pension	Healthcare	Total
Expected Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of June 30, 2019	\$ 15,039,180	\$ 7,151,694	\$ 22,190,874
b. Normal Cost	141,556	87,971	229,527
c. Interest on (a) and (b) at 7.38%	1,120,338	534,287	1,654,625
d. Employer Group Waiver Plan	0	33,177	33,177
e. Benefit Payments	(885,252)	(407,069)	(1,292,321)
f. Refund of Contributions	(10,271)	0	(10,271)
g. Interest on (d) thru (f) at 7.38%, adjusted for timing	(35,214)	(13,551)	(48,765)
h. Assumptions/Methods Changes	0	0	0
i. Expected Actuarial Accrued Liability as of June 30, 2020 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	\$ 15,370,337	\$ 7,386,509	\$ 22,756,846
2. Actual Actuarial Accrued Liability as of June 30, 2020	15,279,525	7,036,550	22,316,075
3. Liability Gain/(Loss), (1)(i) - (2)	\$ 90,812	\$ 349,959	\$ 440,771
4. Expected Actuarial Asset Value			
a. Actuarial Value of Assets as of June 30, 2019	\$ 9,576,693	\$ 7,810,491	\$ 17,387,184
b. Interest on (a) at 7.38%	706,760	576,414	1,283,174
c. Employee Contributions	74,514	0	74,514
d. Employer Contributions	270,460	107,298	377,758
e. State Assistance Contributions	159,055	0	159,055
f. Employer Group Waiver Plan	0	33,177	33,177
g. Interest on (c) thru (f) at 7.38%, adjusted for timing	24,241	5,091	29,332
h. Benefit Payments	(885,252)	(407,069)	(1,292,321)
i. Refund of Contributions	(10,271)	0	(10,271)
j. Administrative Expenses	(7,017)	(6,203)	(13,220)
k. Interest on (h) thru (j) at 7.38%, adjusted for timing	(35,468)	(14,978)	(50,446)
I. Expected Actuarial Asset Value as of June 30, 2020 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h) + (i) + (j) + (k)	\$ 9,873,715	\$ 8,104,221	\$ 17,977,936
5. Actual Actuarial Asset Value as of June 30, 2020	9,713,710	7,989,358	17,703,068
6. Actuarial Asset Value Gain/(Loss), (5) - (4)(I)	\$ (160,005)	\$ (114,863)	\$ (274,868)
7. Total Actuarial Gain/(Loss), (3) + (6)	\$ (69,193)	\$ 235,096	\$ 165,903
8. Contribution Gain/(Loss)	\$ (55,380)	\$ 59,059	\$ 3,679
9. Administrative Expense Gain/(Loss)	\$ 72	\$ (2,408)	\$ (2,336)
10. FY20 Gain/(Loss), (7) + (8) + (9)	\$ (124,501)	\$ 291,747	\$ 167,246

Section 1.5: Development of Change in Unfunded Liability During FY20 (\$'s in 000's)

	Pension	Н	ealthcare	Total
1. 2019 Unfunded Liability	\$ 5,462,487	\$	(658,797)	\$ 4,803,690
a. Interest on Unfunded Liability at 7.38%	\$ 403,132	\$	(48,619)	\$ 354,513
b. Normal Cost	141,556		87,971	229,527
c. Employee Contributions	(74,514)		0	(74,514)
d. Employer Contributions	(270,460)		(107,298)	(377,758)
e. State Assistance Contributions	(159,055)		0	(159,055)
f. Administrative Expenses	7,017		6,203	13,220
g. Interest on (b) thru (f) at 7.38%, adjusted for timing	(13,541)		2,828	(10,713)
h. Assumptions/Methods Changes	 0		0	0
i. Expected Change in Unfunded Liability During FY20(a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	\$ 34,135	\$	(58,915)	\$ (24,780)
2. Expected 2020 Unfunded Liability, (1) + (1)(i)	\$ 5,496,622	\$	(717,712)	\$ 4,778,910
a. Liability (Gain)/Loss During FY20	\$ (90,812)	\$	(349,959)	\$ (440,771)
b. Actuarial Assets (Gain)/Loss During FY20	 160,005		114,863	 274,868
c. Total Actuarial (Gain)/Loss During FY20	\$ 69,193	\$	(235,096)	\$ (165,903)
3. Actual 2020 Unfunded Liability, (2) + (2)(c)	\$ 5,565,815	\$	(952,808)	\$ 4,613,007

Section 1.6: Analysis of Financial Experience

Pension
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience

	Cha	nge in Employer / S	State Contribution	Rate During Fiscal	Year
			Pension		
Type of (Gain) or Loss	2016	2017	2018	2019	2020
1. Health Claims	N/A	N/A	N/A	N/A	N/A
2. Salary Experience	(0.20%)	(0.36%)	(0.30%)	0.16%	(0.03%)
3. Investment Experience	0.73%	0.64%	0.52%	0.50%	0.44%
4. Demographic Experience and Miscellaneous	(0.33%)	(0.19%)	0.26%	(0.45%)	(0.19%)
5. Actual vs Expected Contributions	0.16%	<u>0.15%</u>	0.14%	<u>0.11%</u>	<u>0.15%</u>
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	0.36%	0.24%	0.62%	0.32%	0.37%
7. Assumptions / Method Changes	1.00%	0.00%	1.65%	0.00%	0.00%
8. System Benefit Changes	0.00%	0.00%	0.00%	0.00%	0.00%
 Composite (Gain) or Loss During Year, (6) + (7) + (8) 	1.36%	0.24%	2.27%	0.32%	0.37%
10. Beginning Total Employer / State Contribution Rate	<u>15.98%</u>	17.34%	17.58%	<u>19.85%</u>	<u>20.17% </u>
 Ending Valuation Year Employer / State Contribution Rate, (9) + (10) 	17.34%	17.58%	19.85%	20.17%	20.54%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	18.27%	18.29%	20.66%	20.89%	20.90% *
b. Fiscal Year for which Rate Applies	FY19	FY20	FY21	FY22	FY23

^{*} Expected rate. Actual rate to be determined

Healthcare
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Cha	nge in Employer / S	State Contribution	Rate During Fiscal	Year
			Healthcare		
Type of (Gain) or Loss	2016	2017	2018	2019	2020
1. Health Claims ¹	0.59%	(2.46%)	(1.51%)	(2.39%)	(0.87%)
2. Salary Experience	N/A	N/A	N/A	N/A	N/A
3. Investment Experience	0.60%	0.51%	0.40%	0.38%	0.31%
4. Demographic Experience and Miscellaneous	0.00%	(0.48%)	(1.08%)	1.16%	0.38%
5. Actual vs Expected Contributions	<u>(0.41%)</u>	<u>(0.12%)</u>	0.06%	0.02%	<u>(0.16%)</u>
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	0.78%	(2.55%)	(2.13%)	(0.83%)	(0.34%)
7. Assumptions / Method Changes	0.50%	2.89%	2.20%	0.00%	0.00%
8. System Benefit Changes	0.00%	0.00%	0.00%	0.00%	0.00%
 Composite (Gain) or Loss During Year, (6) + (7) + (8) 	1.28%	0.34%	0.07%	(0.83%)	(0.34%)
10. Beginning Total Employer / State Contribution Rate	3.05%	4.33%	4.67%	4.74%	3.91%
 Ending Valuation Year Employer / State Contribution Rate, (9) + (10) 	4.33%	4.67%	4.74%	3.91%	3.57%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	4.37%	4.89%	4.27%	3.12%	2.84% *
b. Fiscal Year for which Rate Applies	FY19	FY20	FY21	FY22	FY23

^{*} Expected rate. Actual rate to be determined

¹ The 2016 health claims percentage includes the effect of healthcare demographic experience gain/loss

Total
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Cha	nge in Employer / S	State Contribution	Rate During Fiscal	Year
			Total		
Type of (Gain) or Loss	2016	2017	2018	2019	2020
1. Health Claims ¹	0.59%	(2.46%)	(1.51%)	(2.39%)	(0.87%)
2. Salary Experience	(0.20%)	(0.36%)	(0.30%)	0.16%	(0.03%)
3. Investment Experience	1.33%	1.15%	0.92%	0.88%	0.75%
4. Demographic Experience and Miscellaneous	(0.33%)	(0.67%)	(0.82%)	0.71%	0.19%
5. Actual vs Expected Contributions	(0.25%)	0.03%	0.20%	0.13%	<u>(0.01%)</u>
 (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5) 	1.14%	(2.31%)	(1.51%)	(0.51%)	0.03%
7. Assumptions / Method Changes	1.50%	2.89%	3.85%	0.00%	0.00%
8. System Benefit Changes	0.00%	0.00%	0.00%	0.00%	0.00%
 Composite (Gain) or Loss During Year, (6) + (7) + (8) 	2.64%	0.58%	2.34%	(0.51%)	0.03%
10. Beginning Total Employer / State Contribution Rate	19.03%	<u>21.67%</u>	22.25%	24.59%	24.08%
 Ending Valuation Year Employer / State Contribution Rate, (9) + (10) 	21.67%	22.25%	24.59%	24.08%	24.11%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	22.64%	23.18%	24.93%	24.01%	23.74% *
b. Fiscal Year for which Rate Applies	FY19	FY20	FY21	FY22	FY23

^{*} Expected rate. Actual rate to be determined

¹ The 2016 health claims percentage includes the effect of healthcare demographic experience gain/loss

Section 1.7: History of Unfunded Liability and Funded Ratio (\$'s in 000's)

Valuation Date	Total Actuarial Accrued Liability	Valuation Assets	Assets as a Percent of Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability (UAAL)
June 30, 2003	\$ 10,561,653	\$ 7,687,281	72.8%	\$ 2,874,372
June 30, 2004	11,443,916	8,030,414	70.2%	3,413,502
June 30, 2005	12,844,841	8,442,919	65.7%	4,401,922
June 30, 2006	14,388,413	9,040,908	62.8%	5,347,505
June 30, 2007	14,570,933	9,900,960	68.0%	4,669,973
June 30, 2008	15,888,141	11,040,106	69.5%	4,848,035
June 30, 2009	16,579,371	10,242,978	61.8%	6,336,393
June 30, 2010	18,132,492	11,157,464	61.5%	6,975,028
June 30, 2011	18,740,550	11,813,774	63.0%	6,926,776
June 30, 2012	19,292,361	11,832,030	61.3%	7,460,331
June 30, 2013	19,992,759	12,162,626	60.8%	7,830,133
June 30, 2014	20,897,372	14,644,598	70.1%	6,252,774
June 30, 2015	20,648,663	16,173,459	78.3%	4,475,204
June 30, 2016	21,369,490	16,467,992	77.1%	4,901,498
June 30, 2017	21,881,395	16,786,771	76.7%	5,094,624
June 30, 2018	22,264,137	17,116,701	76.9%	5,147,436
June 30, 2019	22,190,874	17,387,184	78.4%	4,803,690
June 30, 2020	22,316,075	17,703,068	79.3%	4,613,007

Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets (\$'s in 000's)

As of June 30, 2020	Pension	H	lealthcare	Total	Allocation Percent
Cash and Short-Term Investments					
- Cash and Cash Equivalents	\$ 104,417	\$	77,183	\$ 181,600	1.1%
- Subtotal	\$ 104,417	\$	77,183	\$ 181,600	1.1%
Fixed Income Investments					
- Domestic Fixed Income Pool	\$ 2,047,425	\$	1,701,267	\$ 3,748,692	21.6%
- International Fixed Income Pool	0		0	0	0.0%
- Tactical Fixed Income Pool	0		0	0	0.0%
- High Yield Pool	0		0	0	0.0%
- Treasury Inflation Protection Pool	0		0	0	0.0%
- Emerging Debt Pool	0		0	0	0.0%
- Subtotal	\$ 2,047,425	\$	1,701,267	\$ 3,748,692	21.6%
Equity Investments					
- Domestic Equity Pool	\$ 2,578,937	\$	2,142,999	\$ 4,721,936	27.3%
- International Equity Pool	1,471,536		1,222,791	2,694,327	15.6%
- Private Equity Pool	1,166,939		969,682	2,136,621	12.3%
- Emerging Markets Equity Pool	307,716		255,700	563,416	3.3%
- Alternative Equity Strategies	 513,333		426,560	 939,893	5.4%
- Subtotal	\$ 6,038,461	\$	5,017,732	\$ 11,056,193	63.9%
Other Investments					
- Real Estate Pool	\$ 580,860	\$	483,662	\$ 1,064,522	6.1%
- Other Investments Pool	695,398		577,850	1,273,248	7.3%
- Absolute Return Pool	0		0	0	0.0%
- Other Assets	15		967	982	0.0%
- Subtotal	\$ 1,276,273	\$	1,062,479	\$ 2,338,752	13.4%
Total Cash and Investments	\$ 9,466,576	\$	7,858,661	\$ 17,325,237	100.0%
Net Accrued Receivables	 2,585		(45,150)	 (42,565)	
Net Assets	\$ 9,469,161	\$	7,813,511	\$ 17,282,672	

Section 2.2: Changes in Fair Value of Assets During FY20 (\$'s in 000's)

Fiscal Year 2020	Pension	Н	lealthcare	Total
1. Fair Value of Assets as of June 30, 2019	\$ 9,489,405	\$	7,767,692	\$ 17,257,097
2. Additions:				
a. Employee Contributions	\$ 74,514	\$	0	\$ 74,514
b. Employer Contributions	270,460		107,298	377,758
c. State Assistance Contributions	159,055		0	159,055
d. Interest and Dividend Income	144,330		118,959	263,289
e. Net Appreciation / Depreciation in Fair Value of Investments	261,863		221,506	483,369
f. Employer Group Waiver Plan	0		33,177	33,177
g. Other	 148		458	606
h. Total Additions	\$ 910,370	\$	481,398	\$ 1,391,768
3. Deductions:				
a. Medical Benefits	\$ 0	\$	407,069	\$ 407,069
b. Retirement Benefits	885,252		0	885,252
c. Refund of Contributions	10,271		0	10,271
d. Investment Expenses	28,074		22,307	50,381
e. Administrative Expenses	 7,017		6,203	13,220
f. Total Deductions	\$ 930,614	\$	435,579	\$ 1,366,193
4. Fair Value of Assets as of June 30, 2020	\$ 9,469,161	\$	7,813,511	\$ 17,282,672
Approximate Fair Value Investment Return Rate during FY20 Net of Investment Expenses	4.1%		4.2%	4.1%

Section 2.3: Development of Actuarial Value of Assets (\$'s in 000's)

The actuarial value of asset was set equal to the fair value as of June 30, 2014 and the 20% corridor was eliminated. Investment gains and losses after June 30, 2014 are recognized 20% per year over 5 years.

	Pension	Н	lealthcare	Total
Deferral of Investment Gain / (Loss) for FY20				
a. Fair Value of Assets as of June 30, 2019	\$ 9,489,405	\$	7,767,692	\$ 17,257,097
b. Contributions	504,029		107,298	611,327
c. Employer Group Waiver Plan	0		33,177	33,177
d. Benefit Payments	895,523		407,069	1,302,592
e. Administrative Expenses	7,017		6,203	13,220
f. Actual Investment Return (net of investment expenses)	378,267		318,616	696,883
g. Expected Return Rate (net of investment expenses)	7.38%		7.38%	7.38%
h. Expected Return, Weighted for Timing	689,091		563,369	1,252,460
i. Investment Gain / (Loss) for the Year, (f) - (h)	(310,824)		(244,753)	(555,577)
2. Actuarial Value as of June 30, 2020				
a. Fair Value as of June 30, 2020	\$ 9,469,161	\$	7,813,511	\$ 17,282,672
b. Deferred Investment Gain / (Loss)	(244,549)		(175,847)	(420,396)
c. Actuarial Value as of June 30, 2020, (a) - (b)	9,713,710		7,989,358	17,703,068
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	102.6%		102.3%	102.4%
Approximate Actuarial Value Investment Return Rate during FY20 Net of Investment Expenses	5.7%		5.9%	5.8%

The tables below show the development of the gains/(losses) to be recognized in the current year (\$'s in 000's):

		Pension		
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2016	\$ (732,190)	\$ (585,752)	\$ (146,438)	\$ 0
June 30, 2017	393,607	236,163	78,721	78,723
June 30, 2018	17,834	7,134	3,567	7,133
June 30, 2019	(136,242)	(27,248)	(27,248)	(81,746)
June 30, 2020	(310,824)	0	(62,165)	(248,659)
Total	\$ (767,815)	\$ (369,703)	\$ (153,563)	\$ (244,549)

Healthcare							
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years			
June 30, 2016	\$ (584,781)	\$ (467,824)	\$ (116,957)	\$ 0			
June 30, 2017	341,151	204,690	68,230	68,231			
June 30, 2018	30,997	12,398	6,199	12,400			
June 30, 2019	(101,128)	(20,226)	(20,226)	(60,676)			
June 30, 2020	(244,753)	0	(48,951)	(195,802)			
Total	\$ (558,514)	\$ (270,962)	\$ (111,705)	\$ (175,847)			

Total							
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years			
June 30, 2016	\$(1,316,971)	\$ (1,053,576)	\$ (263,395)	\$ 0			
June 30, 2017	734,758	440,853	146,951	146,954			
June 30, 2018	48,831	19,532	9,766	19,533			
June 30, 2019	(237,370)	(47,474)	(47,474)	(142,422)			
June 30, 2020	(555,577)	0	(111,116)	(444,461)			
Total	\$ (1,326,329)	\$ (640,665)	\$ (265,268)	\$ (420,396)			

Section 2.4: Historical Asset Rates of Return

	Actuar	rial Value	Fair Value			
Year Ending	Annual	Cumulative*	Annual	Cumulative*		
June 30, 2005	8.7%	8.7%	8.5%	8.5%		
June 30, 2006	9.3%	9.0%	11.4%	9.9%		
June 30, 2007	11.6%	9.9%	18.5%	12.7%		
June 30, 2008	10.0%	9.9%	(3.1%)	8.5%		
June 30, 2009	(7.3%)	6.2%	(20.5%)	2.0%		
June 30, 2010	7.2%	6.4%	10.2%	3.3%		
June 30, 2011	7.2%	6.5%	20.4%	5.6%		
June 30, 2012	1.2%	5.8%	0.2%	4.9%		
June 30, 2013	4.0%	5.6%	12.1%	5.7%		
June 30, 2014	21.9%	7.1%	18.1%	6.9%		
June 30, 2015	7.0%	7.1%	2.9%	6.5%		
June 30, 2016	5.0%	6.9%	(0.7%)	5.9%		
June 30, 2017	5.4%	6.8%	12.8%	6.4%		
June 30, 2018	6.1%	6.8%	8.2%	6.5%		
June 30, 2019	5.5%	6.7%	6.0%	6.5%		
June 30, 2020	5.8%	6.6%	4.1%	6.3%		

^{*} Cumulative since fiscal year ending June 30, 2005

Section 3: Projections

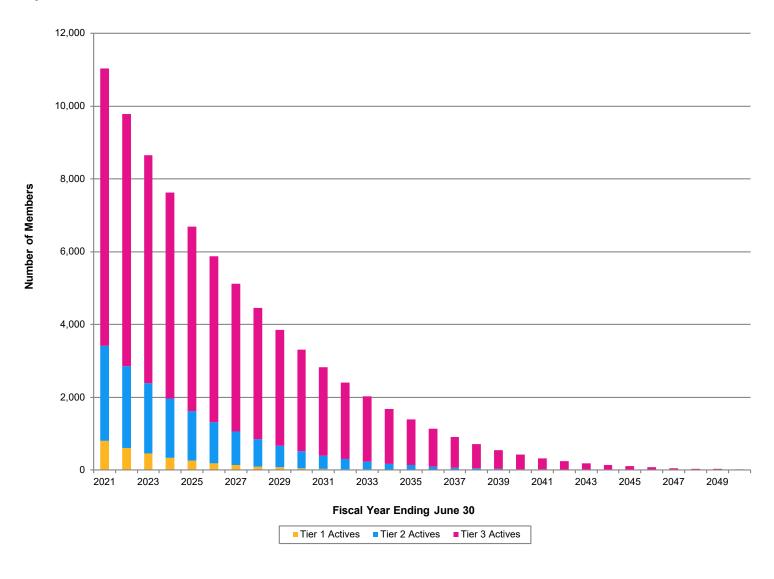
Section 3.1: Projection Assumptions and Methods

Key Assumptions

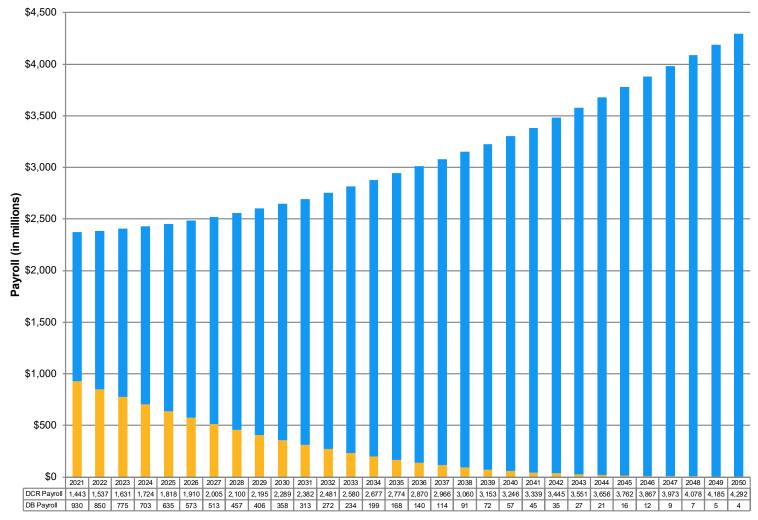
- 7.38% investment return (net of investment expenses) on the Fair Value of Assets in all future years.
- The Actuarial Value of Assets was re-initialized to Fair Value as of June 30, 2014. The Actuarial Value of Assets after June 30, 2014 reflects the deferred gains and losses generated by the smoothing method. The current deferred amount is recognized in the first four years of the projections.
- Actuarial assumptions and methods as described in Section 5. No actuarial gains/losses are assumed after June 30, 2020.
- The actuarially calculated contribution rate using a two-year roll-forward approach is adopted each year.
- Projections assume a 0% increase in the total active member population. All new members are expected to enter the DCR plan.
- Contribution rates are determined as a percent of total DB and DCR payroll.
- The DCR contribution rate determined as of June 30, 2020 is assumed to remain constant in all future years.
- The active rehire assumption shown in Section 5 is assumed to grade to zero on a uniform basis over 20 years.
- The Normal Cost is increased by the administrative expenses shown in Section 5. For future years, the percent increase is assumed to remain constant.

Section 3.2: Membership Projection

Projected Active Member Count



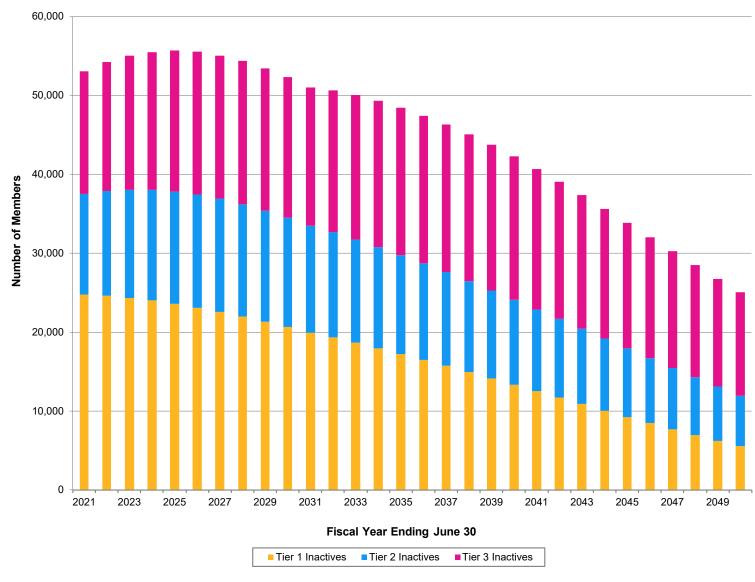
Projected DB and DCR Payroll



Fiscal Year Ending June 30

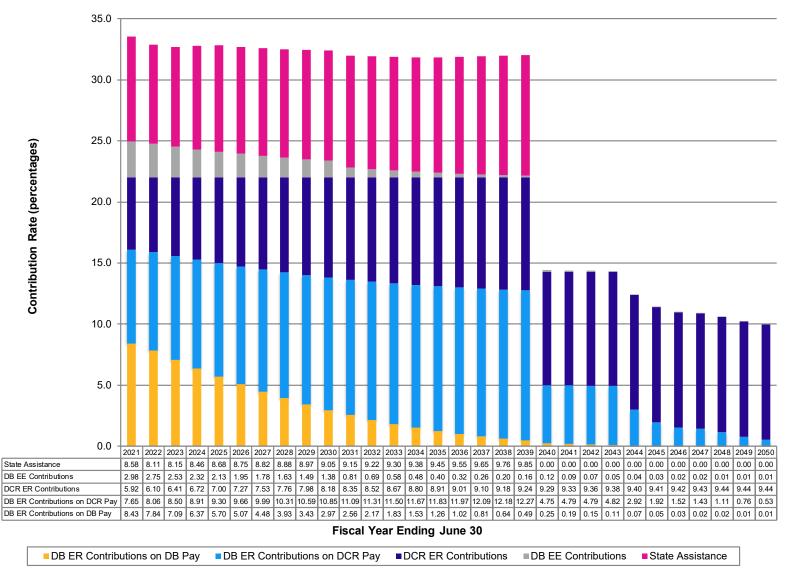
■DB Payroll ■DCR Payroll

Projected Inactive Member Count

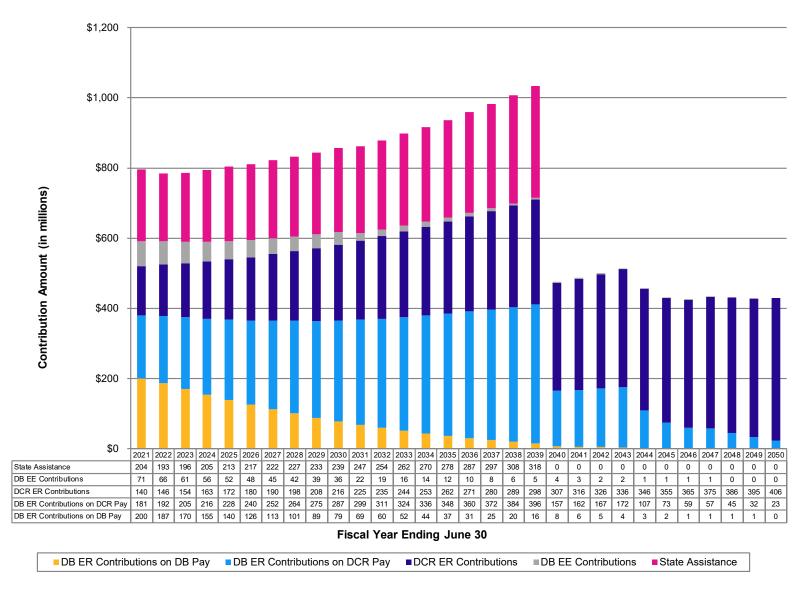


Section 3.3: Projected Employer/State Contribution Rates

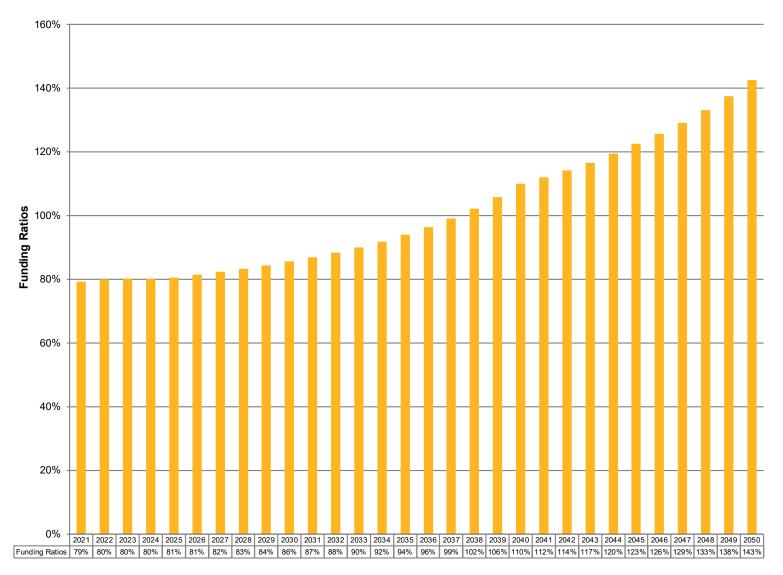
Based on Total DB and DCR Payroll



Section 3.4: Projected Employer/State Contribution Amounts



Section 3.5: Projection of Funded Ratios



Fiscal Year Ending June 30

Section 3.6: Table of Projected Actuarial Results (\$'s in 000's)

	Valuation Amounts on July 1 (Beginning of FY) Cash Flow Amounts during Following 12 Months													
Fiscal				Unfunded		Cont	tribution Ra	ites		DB Cont	ributions			Deferred Asset
Year End	Actuarial Assets	Accrued Liability	Funding Ratio	Liability / (Surplus)	Total Salaries	Employer / State	DCR	Total	Employer	State Assistance	Employee	Total	Benefit Payments	Gain / (Loss)
2021	\$17,703,068	\$22,316,075	79.3%	\$ 4,613,007	\$ 2,373,078	24.66%	5.92%	30.58%	\$ 381,591	\$ 203,585	\$ 70,747	\$ 655,923	\$ 1,352,299	\$ (418,528)
2022	18,247,187	22,784,800	80.1%	4,537,613	2,386,626	24.01%	6.10%	30.11%	379,474	193,494	65,590	638,558	1,421,212	(269,705)
2023	18,595,915	23,193,406	80.2%	4,597,491	2,405,076	23.74%	6.41%	30.15%	374,951	196,014	60,746	631,711	1,489,985	(111,116)
2024	18,894,305	23,547,126	80.2%	4,652,821	2,427,345	23.74%	6.72%	30.46%	370,898	205,353	56,410	632,661	1,555,059	0
2025	19,208,705	23,835,914	80.6%	4,627,209	2,453,152	23.68%	7.00%	30.68%	367,973	212,934	52,320	633,227	1,616,352	0
2026	19,603,824	24,064,939	81.5%	4,461,115	2,482,633	23.48%	7.27%	30.75%	365,692	217,230	48,466	631,388	1,673,417	0
2027	19,968,002	24,236,014	82.4%	4,268,012	2,518,456	23.29%	7.53%	30.82%	364,421	222,128	44,877	631,426	1,725,814	0
2028	20,305,701	24,350,613	83.4%	4,044,912	2,557,461	23.12%	7.76%	30.88%	364,183	227,103	41,747	633,033	1,777,534	0
2029	20,617,244	24,407,417	84.5%	3,790,173	2,600,575	22.99%	7.98%	30.97%	364,600	233,272	38,835	636,707	1,825,840	0
2030	20,906,363	24,406,459	85.7%	3,500,096	2,646,356	22.87%	8.18%	31.05%	365,726	239,495	36,390	641,611	1,873,521	0
2031	21,173,270	24,345,754	87.0%	3,172,484	2,695,674	22.80%	8.35%	31.15%	367,960	246,654	21,835	636,449	1,907,575	0
2032	21,420,038	24,222,943	88.4%	2,802,905	2,753,450	22.70%	8.52%	31.22%	371,165	253,868	18,999	644,032	1,950,868	0
2033	21,648,740	24,037,418	90.1%	2,388,678	2,813,927	22.63%	8.67%	31.30%	375,096	261,695	16,321	653,112	1,991,642	0
2034	21,862,183	23,787,589	91.9%	1,925,406	2,876,779	22.58%	8.80%	31.38%	379,735	269,842	13,809	663,386	2,025,140	0
2035	22,067,995	23,477,147	94.0%	1,409,152	2,942,401	22.54%	8.91%	31.45%	385,160	278,057	11,770	674,987	2,054,265	0
2036	22,271,486	23,106,796	96.4%	835,310	3,010,276	22.54%	9.01%	31.55%	391,035	287,481	9,633	688,149	2,078,154	0
2037	22,479,542	22,678,036	99.1%	198,494	3,079,581	22.55%	9.10%	31.65%	397,266	297,180	8,007	702,453	2,097,506	0
2038	22,698,380	22,193,626	102.3%	(504,754)	3,150,757	22.58%	9.18%	31.76%	403,927	307,514	6,302	717,743	2,107,908	0
2039	22,939,090	21,658,492	105.9%	(1,280,598)	3,225,637	22.61%	9.24%	31.85%	411,592	317,725	5,161	734,478	2,112,689	0
2040	23,210,569	21,075,430	110.1%	(2,135,139)	3,303,529	5.00%	9.29%	14.29%	165,177	0	3.964	169.141	2,106,710	0
2041	22,910,733	20,452,598	112.0%	(2,458,135)	3,384,397	4.98%	9.33%	14.31%	168,543	0	3,046	171,589	2,093,286	0
2042	22,605,407	19,795,332	114.2%	(2,810,075)	3,480,660	4.94%	9.36%	14.30%	171,945	0	2,436	174,381	2,070,972	0
2043	22,303,744	19,113,840	116.7%	(3,189,904)	3,578,351	4.93%	9.38%	14.31%	176,413	0	1,789	178,202	2,041,737	0
2044	22,014,246	18,408,000	119.6%	(3,606,246)	3,677,480	2.99%	9.40%	12.39%	109,957	0	1,471	111,428	2,000,543	0
2045	21,677,042	17,691,616	122.5%	(3,985,426)	3,777,877	1.97%	9.41%	11.38%	74,424	0	1,133	75,557	1,953,832	0
2046	21,326,348	16,969,894	125.7%	(4,356,454)	3,879,356	1.55%	9.42%	10.97%	60,130	0	776	60,906	1,900,124	0
2047	20,990,408	16,249,910	129.2%	(4,740,498)	3,981,953	1.45%	9.43%	10.88%	57,738	0	796	58,534	1,839,620	0
2048	20,690,074	15,539,015	133.1%	(5,151,059)		1.13%	9.44%	10.57%	46,159	0	408	46,567	1,776,589	0
2049	20,420,650	14,840,648	137.6%	(5,580,002)	4,189,471	0.77%	9.44%	10.21%	32,259	0	419	32,678	1,710,031	0
2050	20,186,081	14,159,513	142.6%	(6,026,568)	4,295,833	0.54%	9.44%	9.98%	23,198	0	430	23,628	1,643,351	0
	, , -	, , -		(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	, , ,			Total		\$ 4,670,624	\$ 644,633	\$ 13,583,645		

The FY21 and FY22 Employer/State contribution rates shown above differ from those shown in Section 1.6 because they are adjusted for total salaries.

Section 3.6: Table of Projected Actuarial Results (\$'s in 000's) (continued)

	Valuation Amounts on July 1 (Beginning of FY)										
Fiscal		Funding Ratio		Unfund	Unfunded Liability / (Surplus)						
Year End	Pension	Healthcare	Total	Pension	Healthcare	Total					
2021	63.6%	113.5%	79.3%	\$ 5,565,815	\$ (952,808)	\$ 4,613,007					
2022	64.3%	114.2%	80.1%	5,561,711	(1,024,098)	4,537,613					
2023	64.5%	113.8%	80.2%	5,616,279	(1,018,788)	4,597,491					
2024	64.6%	113.5%	80.2%	5,670,820	(1,017,999)	4,652,821					
2025	65.0%	113.6%	80.6%	5,667,074	(1,039,865)	4,627,209					
2026	65.8%	114.4%	81.5%	5,577,327	(1,116,212)	4,461,115					
2027	66.6%	115.2%	82.4%	5,466,222	(1,198,210)	4,268,012					
2028	67.5%	116.2%	83.4%	5,331,838	(1,286,926)	4,044,912					
2029	68.4%	117.2%	84.5%	5,172,138	(1,381,965)	3,790,173					
2030	69.5%	118.4%	85.7%	4,984,787	(1,484,691)	3,500,096					
2031	70.6%	119.6%	87.0%	4,767,513	(1,595,029)	3,172,484					
2032	71.9%	121.1%	88.4%	4,516,939	(1,714,034)	2,802,905					
2033	73.4%	122.6%	90.1%	4,230,042	(1,841,364)	2,388,678					
2034	75.1%	124.4%	91.9%	3,903,416	(1,978,010)	1,925,406					
2035	77.1%	126.3%	94.0%	3,533,951	(2,124,799)	1,409,152					
2036	79.4%	128.5%	96.4%	3,117,863	(2,282,553)	835,310					
2037	82.1%	131.0%	99.1%	2,651,097	(2,452,603)	198,494					
2038	85.2%	133.8%	102.3%	2,129,291	(2,634,045)	(504,754)					
2039	88.9%	136.9%	105.9%	1,548,008	(2,828,606)	(1,280,598)					
2040	93.4%	140.5%	110.1%	902,171	(3,037,310)	(2,135,139)					
2041	93.9%	144.5%	112.0%	803,243	(3,261,378)	(2,458,135)					
2042	94.5%	149.1%	114.2%	691,969	(3,502,044)	(2,810,075)					
2043	95.3%	154.2%	116.7%	567,737	(3,757,641)	(3,189,904)					
2044	96.3%	160.1%	119.6%	428,715	(4,034,961)	(3,606,246)					
2045	96.9%	166.7%	122.5%	347,123	(4,332,549)	(3,985,426)					
2046	97.2%	174.1%	125.7%	295,695	(4,652,149)	(4,356,454)					
2047	97.5%	182.5%	129.2%	254,785	(4,995,283)	(4,740,498)					
2048	97.8%	192.0%	133.1%	212,951	(5,364,010)	(5,151,059)					
2049	98.1%	202.6%	137.6%	179,738	(5,759,740)	(5,580,002)					
2050	98.2%	214.4%	142.6%	158,264	(6,184,832)	(6,026,568)					

Section 3.7: Projected Pension Benefit Recipients and Amounts (\$'s in 000's)

Fiscal Year End Recipient Counts Benefit Amounts Fiscal Year End 2021 37,106 \$ 944,242 2063 2022 38,793 992,490 2064 2023 40,216 1,040,553 2065 2024 41,390 1,085,744 2066 2025 42,305 1,128,793 2067 2026 42,941 1,168,682 2068 2027 43,341 1,207,416 2069 2028 43,552 1,244,432 2070 2029 43,570 1,278,265 2071 2030 43,434 1,310,048 2072 2031 43,151 1,326,467 2073 2032 42,720 1,351,117 2074 2033 42,174 1,372,363 2075 2034 41,490 1,389,157 2076 2035 40,692 1,402,114 2077 2036 39,762 1,411,600 2078 2037 38,757 1,4		Per	nsion
2022 38,793 992,490 2064 2023 40,216 1,040,553 2065 2024 41,390 1,085,744 2066 2025 42,305 1,128,793 2067 2026 42,941 1,168,682 2068 2027 43,341 1,207,416 2069 2028 43,552 1,244,432 2070 2029 43,570 1,278,265 2071 2030 43,434 1,310,048 2072 2031 43,151 1,326,467 2073 2032 42,720 1,351,117 2074 2033 42,174 1,372,363 2075 2034 41,490 1,389,157 2076 2035 40,692 1,402,114 2077 2036 39,762 1,411,600 2078 2037 38,757 1,416,691 2079 2038 37,645 1,416,338 2080 2040 35,077 1,399,710 2082	Year		
2022 38,793 992,490 2064 2023 40,216 1,040,553 2065 2024 41,390 1,085,744 2066 2025 42,305 1,128,793 2067 2026 42,941 1,168,682 2068 2027 43,341 1,207,416 2069 2028 43,552 1,244,432 2070 2029 43,570 1,278,265 2071 2030 43,434 1,310,048 2072 2031 43,151 1,326,467 2073 2032 42,720 1,351,117 2074 2033 42,174 1,372,363 2075 2034 41,490 1,389,157 2076 2035 40,692 1,402,114 2077 2036 39,762 1,411,600 2078 2037 38,757 1,416,691 2079 2038 37,645 1,416,338 2080 2040 35,077 1,399,710 2082	2021	37 106	\$ 944 242
2023 40,216 1,040,553 2065 2024 41,390 1,085,744 2066 2025 42,305 1,128,793 2067 2026 42,941 1,168,682 2068 2027 43,341 1,207,416 2069 2028 43,552 1,244,432 2070 2029 43,570 1,278,265 2071 2030 43,434 1,310,048 2072 2031 43,151 1,326,467 2073 2032 42,720 1,351,117 2074 2033 42,174 1,372,363 2075 2034 41,490 1,389,157 2076 2035 40,692 1,402,114 2077 2036 39,762 1,411,600 2078 2037 38,757 1,416,691 2079 2038 37,645 1,416,338 2080 2039 36,410 1,411,150 2081 2040 35,077 1,399,710 2082		•	,
2024 41,390 1,085,744 2066 2025 42,305 1,128,793 2067 2026 42,941 1,168,682 2068 2027 43,341 1,207,416 2069 2028 43,552 1,244,432 2070 2029 43,570 1,278,265 2071 2030 43,434 1,310,048 2072 2031 43,151 1,326,467 2073 2032 42,720 1,351,117 2074 2033 42,174 1,372,363 2075 2034 41,490 1,389,157 2076 2035 40,692 1,402,114 2077 2036 39,762 1,411,600 2078 2037 38,757 1,416,691 2079 2038 37,645 1,416,338 2080 2039 36,410 1,411,150 2081 2040 35,077 1,399,710 2082 2041 33,649 1,384,091 2083		•	,
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2061 6,907 601,843 2103			
	2062	6,162	560,899

Counts include retirees, disabilitants, and beneficiaries.

Section 4: Member Data

Section 4.1: Summary of Members Included

As of June 30		2016		2017		2018		2019	2020
Active Members									
1. Number		16,105		14,719		13,434		12,152	11,033 ¹
2. Average Age		51.74		52.10		52.52		52.84	53.21
3. Average Credited Service		15.95		16.57		17.21		17.80	18.38
4. Average Entry Age		35.79		35.53		35.30		35.04	34.83
5. Average Annual Earnings	\$	75,717	\$	76,902	\$	77,813	\$	82,192	\$ 83,757
6. Number Vested		15,607		14,314		13,103		11,868	10,791
7. Percent Who Are Vested		96.9%		97.2%		97.5%		97.7%	97.8%
Retirees, Disabilitants, and Beneficia	aries								
1. Number		33,353		34,347		35,454		36,310	37,106
2. Average Age		69.02		69.42		69.85		70.29	70.77
Average Years Since Retirement		11.48		11.71		11.87		12.14	12.45
Average Monthly Pension Benefit									
a. Base	\$	1,529	\$	1,574	\$	1,616	\$	1,660	\$ 1,704
b. COLA ²		93		93		94		92	93
c. PRPA ²		245		230		222		241	244
d. Adjustment		1		1		1		1	0
e. Total	\$	1,868	\$	1,898	\$	1,933	\$	1,994	\$ 2,041
Vested Terminations (vested at term	inatio	on, not ref	unde	d contribu	ıtions	, or comm	nence	d benefit)	
1. Number		6,160		5,962		5,660		5,499	5,327
2. Average Age		52.08		52.45		52.56		53.06	53.52
3. Average Monthly Pension Benefit	\$	1,042	\$	1,080	\$	1,087	\$	1,123	\$ 1,158
Non-Vested Terminations (not veste	d at t	ermination	ı, not	refunded	cont	ributions)			
1. Number		11,880		11,506		11,192		10,921	10,642
2. Average Account Balance	\$	6,212	\$	6,462	\$	6,558	\$	6,923	\$ 7,060
Total Number of Members		67,498		66,534		65,740		64,882	64,108

¹ Includes 5,143 male active members and 5,890 female active members.

² Calculated by taking the average of the data field, as provided by the State of Alaska, for all participants in the group.

Summary of Members Included

DB												
As of June 30, 2020		Tier 1		Tier 2		Tier 3		Total	DC	R Tier 4	Gra	nd Total
Active Members												
1. Number		811		2,604		7,618		11,033		22,923		33,956
2. Average Age		62.60		56.29		51.16		53.21		41.21		45.11
3. Average Credited Service		23.14		22.92		16.32		18.38		4.66		9.12
4. Average Entry Age		39.46		33.37		34.84		34.83		36.55		35.99
5. Annual Earnings												
a. Total (000's)	\$	63,777	\$	229,189	\$	631,121	\$	924,087	\$ 1	,428,140	\$ 2	,352,227
b. Average	\$	78,640	\$	88,014	\$	82,846	\$	83,757	\$	62,302	\$	69,273

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

As of June 30, 2020	Tier 1	Tier 2	Tier 3	Total
Retirees, Disabilitants, and Beneficiaries				
1. Number	23,447	8,891	4,768	37,106
2. Average Age	72.24	68.79	67.18	70.77
3. Average Years Since Retirement	15.45	8.31	5.31	12.45
4. Average Monthly Pension Benefit				
a. Base	\$ 1,739	\$ 1,823	\$ 1,312	\$ 1,704
b. COLA	118	55	42	93
c. PRPA	336	107	48	244
d. Adjustment	0	1	2	0
e. Total	\$ 2,193	\$ 1,986	\$ 1,404	\$ 2,041

Summary of Members Included

	Inactive Members							
As of June 30, 2020	Active Members	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members		
Retiree Medical Participants								
1. Retiree Coverage Only	10,908	19,141	0	0	2,200	21,341		
2. Retiree + Spouse	0	12,543	12,543	0	3,391	28,477		
3. Retiree + Children / Dependents	0	393	0	402	0	795		
4. Family	0	780	780	1,091	0	2,651		
5. Total	10,908	32,857	13,323	1,493	5,591	53,264		

As of June 30, 2020	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
Retiree Medical Participants					
1. Pre-Medicare	7,797	4,937	1,493	5,426	19,653
2. Medicare Part A & B	24,860	8,345	0	165	33,370
3. Medicare Part B Only	200	41	0	0	241
4. Total	32,857	13,323	1,493	5,591	53,264

As of June 30, 2020	Retirees
Summary of Retiree Medical Data Received	
Retiree records on pension data	37,106
2. Remove duplicates on pension data	(1,125)
3. Valued in a different retiree healthcare plan ¹	(1,150)
4. Records without medical coverage	(2,199)
5. Medical only retirees	225
6. Total	32,857

¹ Each member's retiree medical benefits are valued in the plan indicated in the data from Aetna

Summary of Members Included

Active Members - DB Only

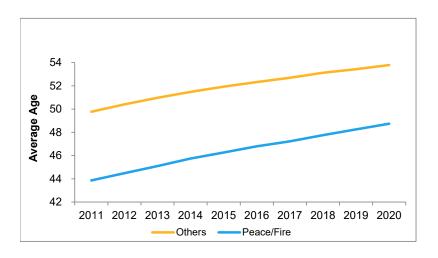
As of June 30		2016	2017	2018	2019	2020
Peace Officer / Firefighter						
1. Number		1,704	1,606	1,507	1,382	1,266 ¹
2. Average Age		46.80	47.22	47.75	48.25	48.74
3. Average Credited Service		16.87	17.41	18.15	18.90	19.45
4. Average Entry Age		29.93	29.81	29.60	29.35	29.29
5. Average Annual Earnings	\$ 1	05,317	\$ 106,987	\$ 108,580	\$ 120,089	\$ 123,436
6. Number Vested		1,695	1,599	1,500	1,374	1,260
7. Percent Who Are Vested		99.5%	99.6%	99.5%	99.4%	99.5%
Others						
1. Number		14,401	13,113	11,927	10,770	9,767 ²
2. Average Age		52.32	52.70	53.12	53.43	53.79
3. Average Credited Service		15.84	16.47	17.09	17.66	18.24
4. Average Entry Age		36.48	36.23	36.03	35.77	35.55
5. Average Annual Earnings	\$	72,214	\$ 73,218	\$ 73,926	\$ 77,329	\$ 78,613
6. Number Vested		13,912	12,715	11,603	10,494	9,531
7. Percent Who Are Vested		96.6%	97.0%	97.3%	97.4%	97.6%
Total						
1. Number		16,105	14,719	13,434	12,152	11,033
2. Average Age		51.74	52.10	52.52	52.84	53.21
3. Average Credited Service		15.95	16.57	17.21	17.80	18.38
4. Average Entry Age		35.79	35.53	35.30	35.04	34.83
5. Average Annual Earnings	\$	75,717	\$ 76,902	\$ 77,813	\$ 82,192	\$ 83,757
6. Number Vested		15,607	14,314	13,103	11,868	10,791
7. Percent Who Are Vested		96.9%	97.2%	97.5%	97.7%	97.8%

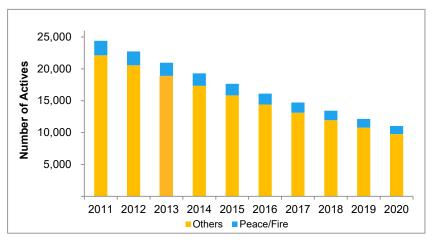
Average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

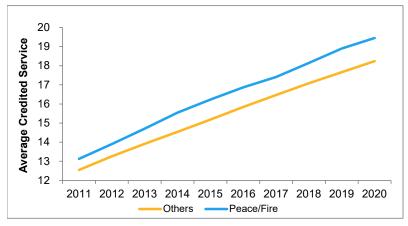
¹ Includes 1,079 male active members and 187 female active members.

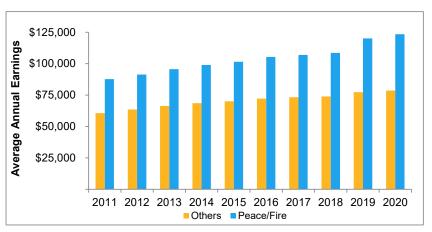
² Includes 4,064 male active members and 5,703 female active members.

Summary of Members Included - Active Members at June 30









Average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 4.2: Age and Service Distribution of Active Members

Peace Officer / Firefighter

Annual Earnings by Age

Age	Number	Total Annual Earnings	Average Annual Earnings
0 - 19	0	\$ 0	\$ 0
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	4	408,811	102,203
35 - 39	114	13,859,704	121,576
40 - 44	262	33,452,322	127,681
45 - 49	370	46,256,845	125,019
50 - 54	304	38,084,025	125,276
55 - 59	156	18,254,063	117,013
60 - 64	39	4,287,148	109,927
65 - 69	14	1,372,890	98,064
70 - 74	3	294,708	98,236
75+	0	0	0

Total 1,266 \$156,270,516 \$ 123,436

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	0	\$ 0	\$ 0
1	2	111,157	55,579
2	0	0	0
3	1	66,184	66,184
4	2	213,466	106,733
0 - 4	5	\$ 390,807	\$ 78,161
5 - 9	16	1,302,626	81,414
10 - 14	201	22,407,573	111,480
15 - 19	521	62,103,286	119,200
20 - 24	361	48,056,326	133,120
25 - 29	134	18,486,683	137,960
30 - 34	25	3,096,577	123,863
35 - 39	2	320,210	160,105
40+	1	106,428	106,428

\$156,270,516

Years of Credited Service by Age

	Years of Service											
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total		
0 - 19	0	0	0	0	0	0	0	0	0	0		
20 - 24	0	0	0	0	0	0	0	0	0	0		
25 - 29	0	0	0	0	0	0	0	0	0	0		
30 - 34	0	1	2	1	0	0	0	0	0	4		
35 - 39	0	3	58	53	0	0	0	0	0	114		
40 - 44	2	3	51	146	59	1	0	0	0	262		
45 - 49	1	2	36	139	152	40	0	0	0	370		
50 - 54	1	2	28	88	108	68	9	0	0	304		
55 - 59	1	3	20	74	31	18	8	1	0	156		
60 - 64	0	0	4	17	8	3	6	1	0	39		
65 - 69	0	2	2	2	3	4	1	0	0	14		
70 - 74	0	0	0	1	0	0	1	0	1	3		
75+	0	0	0	0	0	0	0	0	0	0		
Total	5	16	201	521	361	134	25	2	1	1,266		

Total

1,266

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

123,436

Age and Service Distribution of Active Members

Others **Annual Earnings by Age**

Age	Number	Total Annual Earnings	Average Annual Earnings
0 - 19	0	\$ 0	\$ 0
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	46	3,247,979	70,608
35 - 39	516	40,040,027	77,597
40 - 44	1,062	84,407,079	79,479
45 - 49	1,506	125,306,747	83,205
50 - 54	1,959	157,426,011	80,360
55 - 59	2,481	192,669,217	77,658
60 - 64	1,446	109,088,955	75,442
65 - 69	562	41,899,213	74,554
70 - 74	153	11,351,675	74,194
75+	36	2,379,772	66,105

Total \$767,816,675 78,613 9,767

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	14	\$ 694,247	\$ 49,589
1	44	2,150,347	48,872
2	53	2,587,818	48,827
3	47	2,503,068	53,257
4	48	2,576,050	53,668
0 - 4	206	\$ 10,511,530	\$ 51,027
5 - 9	591	35,081,327	59,359
10 - 14	2,158	148,468,664	68,799
15 - 19	3,432	271,911,618	79,228
20 - 24	1,960	170,400,897	86,939
25 - 29	1,015	93,089,472	91,714
30 - 34	307	29,230,726	95,214
35 - 39	77	7,294,237	94,730
40+	21	1,828,204	87,057
Total	9,767	\$767,816,675	\$ 78,613

Years of Credited Service by Age

	Years of Service												
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total			
0 - 19	0	0	0	0	0	0	0	0	0	0			
20 - 24	0	0	0	0	0	0	0	0	0	0			
25 - 29	0	0	0	0	0	0	0	0	0	0			
30 - 34	2	21	22	1	0	0	0	0	0	46			
35 - 39	39	60	259	153	5	0	0	0	0	516			
40 - 44	33	94	314	525	96	0	0	0	0	1,062			
45 - 49	32	101	331	618	365	59	0	0	0	1,506			
50 - 54	40	110	392	644	473	252	47	1	0	1,959			
55 - 59	32	95	450	794	561	418	119	12	0	2,481			
60 - 64	17	71	257	487	311	184	86	31	2	1,446			
65 - 69	10	24	106	159	118	84	38	16	7	562			
70 - 74	1	13	23	38	24	17	13	15	9	153			
75+	0	2	4	13	7	1	4	2	3	36			
Total	206	591	2,158	3,432	1,960	1,015	307	77	21	9,767			

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 4.3: Member Data Reconciliation

Pension

			In	active Member	'S		
	Active Members	Due a Refund	Deferred Benefits	Retired Members	Disabled Members	Bene- ficiaries	Total
As of June 30, 2019	12,152	10,887	5,499	31,922 *	173	4,231	64,864
Vested Terminations	(427)	0	427	0	0	0	0
Non-Vested Terminations	(45)	45	0	0	0	0	0
Refund of Contributions	(12)	(203)	(44)	(1)	0	0	(260)
Disability Retirements	(7)	0	(5)	0	12	0	0
Age Retirements	(862)	(19)	(399)	1,309	(29)	0	0
Deaths With Beneficiary	(12)	(10)	(15)	(260)	(4)	301	0
Deaths Without Beneficiary	(6)	(16)	(5)	(419)	(2)	(118)	(566)
Expired Benefits	0	0	0	0	0	0	0
Data Corrections	(1)	(3)	1	2	0	(11)	(12)
Converted To DCR Plan	0	0	0	0	0	0	0
Transfers In/Out	6	(1)	(5)	0	0	0	0
Rehires	246	(86)	(139)	(19)	(1)	0	1
Pick Ups***	1	48	12	2	0	33	96
Net Change	(1,119)	(245)	(172)	614	(24)	205	(741)
As of June 30, 2020	11,033	10,642	5,327	32,536 **	149	4,436	64,123

^{*} Includes 16 medical only retirees
** Includes 15 medical only retirees
*** Pickup beneficiaries are primarily new DROs.

Member Data Reconciliation

Healthcare

			In	nactive Members	5	
	Active Members	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
As of June 30, 2019	12,019	32,290	13,131	1,565	5,781	52,767
Vested Terminations	(396)	0	0	0	396	396
Non-Vested Terminations	(45)	0	0	0	0	0
Refund of Contributions	(13)	(1)	0	0	(120)	(121)
Disability Retirements	(7)	7	4	1	0	12
Age Retirements	(800)	800	425	122	0	1,347
Deferred Retirements	0	286	141	28	(286)	169
Retired without Medical Coverage	(69)	0	0	0	23	23
Deceased	(18)	(742)	(49)	(11)	(39)	(841)
New Beneficiaries	0	144	(144)	0	0	0
Added Retiree Medical Coverage	0	113	40	7	0	160
Added Dependent Coverage	0	0	110	74	0	184
Dropped Retiree Medical Coverage	0	(33)	(10)	(7)	0	(50)
Dropped Dependent Coverage	0	0	(327)	(287)	0	(614)
Rehires	236	(14)	(7)	(4)	(137)	(162)
Transfers In/Out	1	7	9	5	(27)	(6)
Net Change	(1,111)	567	192	(72)	(190)	497
As of June 30, 2020	10,908	32,857	13,323	1,493	5,591	53,264

Section 4.4: Schedule of Active Member Data

Peace Officer / Firefighter

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase in Average Earnings	Number of Participating Employers
June 30, 2020	1,266	\$ 156,271	\$ 123,436	2.8%	153
June 30, 2019	1,382	165,963	120,089	10.6%	155
June 30, 2018	1,507	163,630	108,580	1.5%	155
June 30, 2017	1,606	171,821	106,987	1.6%	155
June 30, 2016	1,704	179,461	105,317	3.8%	155
June 30, 2015	1,827	185,350	101,450	2.5%	159
June 30, 2014	1,958	193,737	98,946	3.4%	159
June 30, 2013	2,065	197,534	95,658	4.8%	159
June 30, 2012	2,164	197,544	91,287	4.1%	160
June 30, 2011	2,275	199,537	87,709	8.6%	160

Others

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase in Average Earnings	Number of Participating Employers
June 30, 2020	9,767	\$ 767,817	\$ 78,613	1.7%	153
June 30, 2019	10,770	832,832	77,329	4.6%	155
June 30, 2018	11,927	881,716	73,926	1.0%	155
June 30, 2017	13,113	960,106	73,218	1.4%	155
June 30, 2016	14,401	1,039,960	72,214	3.2%	155
June 30, 2015	15,833	1,108,218	69,994	2.1%	159
June 30, 2014	17,339	1,188,918	68,569	3.4%	159
June 30, 2013	18,890	1,252,786	66,320	4.5%	159
June 30, 2012	20,566	1,305,337	63,471	4.6%	160
June 30, 2011	22,118	1,342,122	60,680	4.7%	160

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 4.5: Active Member Payroll Reconciliation

Payroll Field	Pay	Payroll Data (000's)				
a) DRB actual reported salaries FY20 in employer list	\$	2,198,657				
b) DRB actual reported salaries FY20 in valuation data		2,172,811				
c) Annualized valuation data		2,352,227				
d) Valuation payroll as of June 30, 2020		2,451,532				
e) Rate payroll for FY21		2,373,078				
f) Rate payroll for FY23		2,405,076				

- a) Actual reported salaries from DRB employer listing showing all payroll paid during FY20, including those who were not active as of June 30, 2020
- b) Payroll from valuation data for people who are in active status as of June 30, 2020
- c) Payroll from (b) annualized for both new entrants and part-timers
- d) Payroll from (c) with one year of salary scale applied to estimate salaries payable for the upcoming year
- e) Payroll from (d) with the part-timer annualization removed
- Payroll from (e) with two years of assumed decrements and salary scale, and 0% population growth

Section 4.6: Summary of New Pension Benefit Recipients

Peace Officer / Firefighter

During the Year Ending June 30		2016	2017	2018	2019	2020
Service						
1. Number		108	119	105	109	118
2. Average Age at Commencement		55.91	56.65	55.70	55.61	55.52
3. Average Monthly Pension Benefit	\$	4,614	\$ 4,166	\$ 4,519	\$ 4,412	\$ 5,199
Survivor (including surviving spouse	and I	DROs)				
1. Number		27	42	44	36	43
2. Average Age at Commencement		61.48	62.88	63.76	68.19	67.92
3. Average Monthly Pension Benefit	\$	1,745	\$ 1,797	\$ 2,187	\$ 1,842	\$ 1,785
Disability						
1. Number		2	4	4	4	3
2. Average Age at Commencement		42.07	49.33	46.56	50.44	51.72
3. Average Monthly Pension Benefit	\$	3,096	\$ 2,427	\$ 3,230	\$ 3,071	\$ 5,276
Total						
1. Number		137	165	153	149	164
2. Average Age at Commencement		56.81	58.06	57.78	58.51	58.70
3. Average Monthly Pension Benefit	\$	4,026	\$ 3,521	\$ 3,814	\$ 3,755	\$ 4,305

Peace Officer / Firefighter

				Years	of Credited	Service		
	() - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+
Period 7/1/2019 – 6/30/2020: Average Monthly Pension Number of Recipients	\$	0	\$ 694 6	\$ 2,212 11	\$ 3,626 23	\$ 5,531 40	\$ 6,829 32	\$ 8,636 9
Period 7/1/2018 – 6/30/2019: Average Monthly Pension Number of Recipients	\$	0	\$ 651 5	\$ 1,933 11	\$ 3,362 25	\$ 4,786 38	\$ 6,196 26	\$ 5,688 6
Period 7/1/2017 – 6/30/2018: Average Monthly Pension Number of Recipients	\$	0 0	\$ 1,063 4	\$ 2,133 18	\$ 3,747 19	\$ 4,847 35	\$ 6,024 30	\$ 7,717 3
Period 7/1/2016 – 6/30/2017: Average Monthly Pension Number of Recipients	\$	0 0	\$ 686 8	\$ 2,075 9	\$ 3,234 28	\$ 4,462 41	\$ 5,151 23	\$ 6,376 14
Period 7/1/2015 – 6/30/2016: Average Monthly Pension Number of Recipients	\$	0 0	\$ 958 6	\$ 1,742 11	\$ 3,347 19	\$ 4,622 30	\$ 5,778 28	\$ 7,221 16
Period 7/1/2014 – 6/30/2015: Average Monthly Pension Number of Recipients	\$	0 0	\$ 1,173 8	\$ 1,621 9	\$ 3,632 26	\$ 4,436 24	\$ 5,457 25	\$ 6,863 7
Period 7/1/2013 – 6/30/2014: Average Monthly Pension Number of Recipients	\$	290 1	\$ 1,423 9	\$ 2,002 10	\$ 2,902 14	\$ 4,014 22	\$ 5,464 16	\$ 6,299 7
Period 7/1/2012 – 6/30/2013: Average Monthly Pension Number of Recipients	\$	0	\$ 865 9	\$ 1,779 8	\$ 2,762 19	\$ 3,793 31	\$ 4,983 18	\$ 4,911 4
Period 7/1/2011 – 6/30/2012: Average Monthly Pension Number of Recipients	\$	0	\$ 1,159 13	\$ 1,161 13	\$ 3,142 12	\$ 3,504 20	\$ 4,673 17	\$ 5,079 7
Period 7/1/2010 – 6/30/2011: Average Monthly Pension Number of Recipients	\$	525 1	\$ 880 8	\$ 1,469 18	\$ 2,666 10	\$ 3,743 24	\$ 4,806 16	\$ 5,661 8

[&]quot;Average Monthly Pension" includes postretirement pension adjustments and cost-of-living increases. Beneficiaries are not included in the table above.

Others

During the Year Ending June 30		2016	2017	2018	2019	2020
Service						
1. Number		1,472	1,393	1,419	1,288	1,166
2. Average Age at Commencement		61.28	61.40	62.19	61.38	61.70
3. Average Monthly Pension Benefit	\$	2,269	\$ 2,404	\$ 2,477	\$ 2,540	\$ 2,701
Survivor (including surviving spouse	and I	DROs)				
	anu		000	004	000	207
1. Number		286	292	261	238	297
2. Average Age at Commencement		66.30	67.12	70.38	69.25	72.09
3. Average Monthly Pension Benefit	\$	1,093	\$ 1,150	\$ 1,120	\$ 1,249	\$ 1,204
Disability						
1. Number		22	14	28	17	9
2. Average Age at Commencement		53.04	52.43	53.80	52.95	54.21
3. Average Monthly Pension Benefit	\$	2,209	\$ 2,405	\$ 1,896	\$ 2,313	\$ 2,422
Total						
1. Number		1,780	1,699	1,708	1,543	1,472
2. Average Age at Commencement		61.98	62.31	63.31	62.50	63.75
3. Average Monthly Pension Benefit	\$	2,079	\$ 2,189	\$ 2,260	\$ 2,339	\$ 2,397

Others

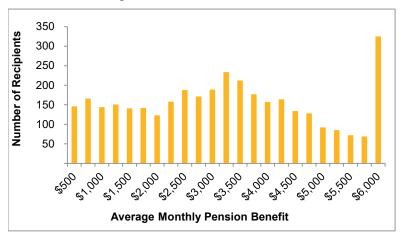
				Years	of Credited S	Service		
	() - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+
Period 7/1/2019 – 6/30/2020: Average Monthly Pension Number of Recipients	\$	492 32	\$ 601 165	\$ 1,311 218	\$ 2,065 258	\$ 3,040 183	\$ 4,686 197	\$ 6,213 122
Period 7/1/2018 – 6/30/2019: Average Monthly Pension Number of Recipients	\$	652 21	\$ 646 190	\$ 1,301 266	\$ 2,071 289	\$ 3,058 222	\$ 4,596 205	\$ 5,685 105
Period 7/1/2017 – 6/30/2018: Average Monthly Pension Number of Recipients	\$	414 26	\$ 607 221	\$ 1,299 351	\$ 1,982 280	\$ 3,034 223	\$ 4,475 214	\$ 6,085 127
Period 7/1/2016 – 6/30/2017: Average Monthly Pension Number of Recipients	\$	381 27	\$ 640 254	\$ 1,271 375	\$ 2,067 233	\$ 3,119 212	\$ 4,579 191	\$ 6,224 115
Period 7/1/2015 – 6/30/2016: Average Monthly Pension Number of Recipients	\$	434 30	\$ 660 323	\$ 1,240 387	\$ 2,017 266	\$ 3,059 192	\$ 4,158 161	\$ 6,583 135
Period 7/1/2014 – 6/30/2015: Average Monthly Pension Number of Recipients	\$	430 42	\$ 685 284	\$ 1,260 304	\$ 2,008 213	\$ 3,086 198	\$ 4,544 169	\$ 6,195 98
Period 7/1/2013 – 6/30/2014: Average Monthly Pension Number of Recipients	\$	503 48	\$ 700 347	\$ 1,189 319	\$ 2,065 241	\$ 3,021 214	\$ 4,439 224	\$ 5,490 121
Period 7/1/2012 – 6/30/2013: Average Monthly Pension Number of Recipients	\$	414 59	\$ 650 349	\$ 1,179 365	\$ 1,925 257	\$ 2,879 206	\$ 4,356 209	\$ 5,208 132
Period 7/1/2011 – 6/30/2012: Average Monthly Pension Number of Recipients	\$	407 67	\$ 610 351	\$ 1,147 314	\$ 1,931 204	\$ 2,805 208	\$ 4,214 188	\$ 5,076 106
Period 7/1/2010 – 6/30/2011: Average Monthly Pension Number of Recipients	\$	409 73	\$ 633 352	\$ 1,150 270	\$ 1,876 227	\$ 2,690 172	\$ 4,294 205	\$ 5,226 105

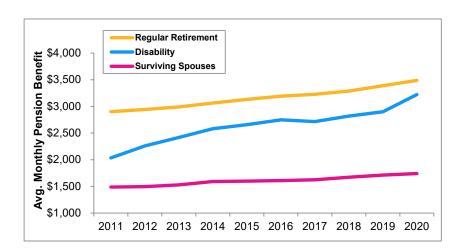
[&]quot;Average Monthly Pension" includes postretirement pension adjustments and cost-of-living increases. Beneficiaries are not included in the table above.

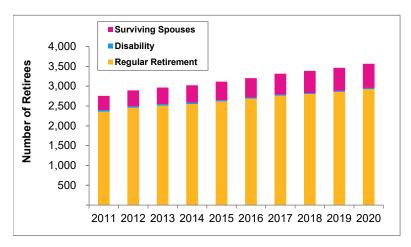
Section 4.7: Summary of All Pension Benefit Recipients

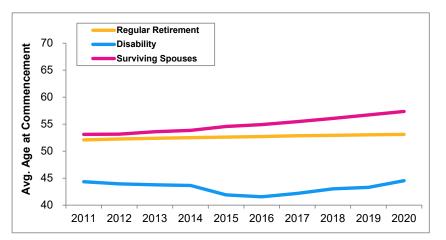
	e Officer / efighter	Others
Service		
1. Number as of June 30, 2019	2,857	29,049
2. Net Change During FY20	74	541
3. Number as of June 30, 2020	2,931	29,590
4. Average Age at Commencement	53.11	58.32
5. Average Current Age	68.27	70.81
6. Average Monthly Pension Benefit	\$ 3,487	\$ 2,025
Survivors (including surviving spouses and DROs)		
1. Number as of June 30, 2019	582	3,649
2. Net Change During FY20	29	176
3. Number as of June 30, 2020	611	3,825
4. Average Age at Commencement	57.36	63.08
5. Average Current Age	68.86	73.26
Average Monthly Pension Benefit	\$ 1,741	\$ 1,099
Disability		
1. Number as of June 30, 2019	26	147
2. Net Change During FY20	0	(24)
3. Number as of June 30, 2020	26	123
Average Age at Commencement	44.53	46.19
5. Average Current Age	49.79	55.00
Average Monthly Pension Benefit	\$ 3,222	\$ 1,903
Total		
1. Number as of June 30, 2019	3,465	32,845
2. Net Change During FY20	103	693
3. Number as of June 30, 2020	3,568	33,538
4. Average Age at Commencement	53.78	58.81
5. Average Current Age	68.24	71.04
Average Monthly Pension Benefit	\$ 3,186	\$ 1,919

Peace Officer / Firefighter

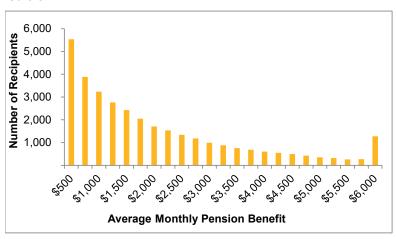


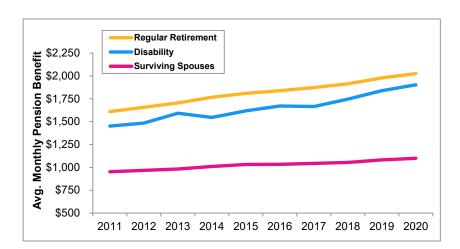


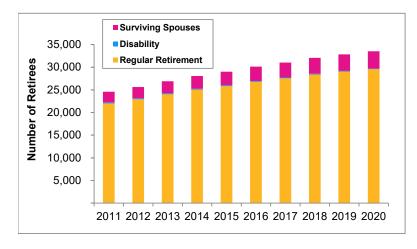


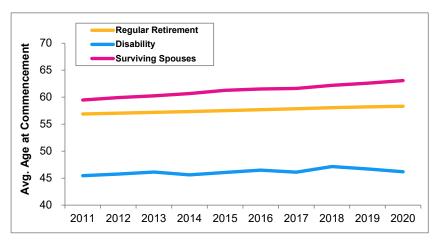


Others









Peace Officer / Firefighter

Annual Pension Benefit by Age

0-19 0 \$ 0 \$ 20-24 0 0 25-29 0 0 30-34 0 0 35-39 4 170,535 40-44 9 419,501 45-49 78 4,222,898 50-54 181 9,898,063 55-59 352 16,029,002 60-64 613 23,598,866	0
25 - 29 0 0 30 - 34 0 0 35 - 39 4 170,535 40 - 44 9 419,501 45 - 49 78 4,222,898 50 - 54 181 9,898,063 55 - 59 352 16,029,002	
30 - 34 0 0 35 - 39 4 170,535 40 - 44 9 419,501 45 - 49 78 4,222,898 50 - 54 181 9,898,063 55 - 59 352 16,029,002	0
35 - 39	0
40 - 44 9 419,501 45 - 49 78 4,222,898 50 - 54 181 9,898,063 55 - 59 352 16,029,002	0
45 - 49 78 4,222,898 50 - 54 181 9,898,063 55 - 59 352 16,029,002	42,634
50 - 54 181 9,898,063 55 - 59 352 16,029,002	46,611
55 - 59 352 16,029,002	54,140
	54,685
60 64 642 22 500 066	45,537
60 - 64 613 23,598,866	38,497
65 - 69 785 28,026,653	35,703
70 - 74 757 27,090,153	35,786
75+ 789 26,958,125	

\$136,413,796 \$

38,233

Annual Pension Benefit by Years Since Commenced

Years Since Comm.	Number		Total Annual Pension Benefit	Average Annual Pension Benefit
0	169	\$	8,847,926	\$ 52,355
1	153		6,820,706	44,580
2	136		6,180,237	45,443
3	169		7,174,157	42,451
4	139		6,662,977	47,935
0 - 4	766	\$	35,686,003	\$ 46,587
5 - 9	554		21,076,891	38,045
10 - 14	553		16,786,316	30,355
15 - 19	658		22,270,942	33,846
20 - 24	565		20,962,357	37,102
25 - 29	227		8,408,349	37,041
30 - 34	181		8,694,152	48,034
35 - 39	44		1,963,535	44,626
40+	20		565,251	28,263
Total	3,568	\$1	136,413,796	\$ 38,233

Years Since Commencement by Age

3,568

Total

	Years Since Commencement												
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total			
0 - 19	0	0	0	0	0	0	0	0	0	0			
20 - 24	0	0	0	0	0	0	0	0	0	0			
25 - 29	0	0	0	0	0	0	0	0	0	0			
30 - 34	0	0	0	0	0	0	0	0	0	0			
35 - 39	3	1	0	0	0	0	0	0	0	4			
40 - 44	7	1	1	0	0	0	0	0	0	9			
45 - 49	64	11	2	0	1	0	0	0	0	78			
50 - 54	126	46	8	1	0	0	0	0	0	181			
55 - 59	192	83	51	21	3	2	0	0	0	352			
60 - 64	184	149	110	138	29	1	1	1	0	613			
65 - 69	92	158	169	227	121	16	1	0	1	785			
70 - 74	46	66	157	182	195	65	35	6	5	757			
75+	52	39	55	89	216	143	144	37	14	789			
Total	766	554	553	658	565	227	181	44	20	3,568			

Others

Annual Pension Benefit by Age

	Total	Ave						
	Annual	Anr						
	Pension	Pan						

Age	Number		Pension Benefit	Pension Benefit
0 - 19	0	\$	0	\$ 0
20 - 24	0		0	0
25 - 29	1		63,300	63,300
30 - 34	1		6,894	6,894
35 - 39	4		63,537	15,884
40 - 44	11		112,161	10,196
45 - 49	36		487,980	13,555
50 - 54	177		5,491,471	31,025
55 - 59	1,451		45,205,759	31,155
60 - 64	6,150	1	64,650,026	26,772

Total 33,538 \$772,395,881 \$ 23,030

212,069,909

166,411,955

177,832,889

24,362

21,748

19,020

Annual Pension Benefit by Years Since Commenced

Years Since Comm.	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0	1,582	\$ 45,597,895	\$ 28,823
1	1,537	42,707,950	27,787
2	1,493	41,043,827	27,491
3	1,646	44,281,323	26,902
4	1,650	42,048,630	25,484
0 - 4	7,908	\$215,679,625	\$ 27,274
5 - 9	7,828	196,401,424	25,090
10 - 14	6,449	138,527,538	21,480
15 - 19	4,936	99,050,931	20,067
20 - 24	3,650	74,080,303	20,296
25 - 29	1,529	26,818,320	17,540
30 - 34	942	17,120,376	18,174
35 - 39	235	3,822,001	16,264
40+	61	895,363	14,678
Total	33,538	\$772,395,881	\$ 23,030

Years Since Commencement by Age

65 - 69

70 - 74

75+

8,705

7,652

9,350

	Years Since Commencement												
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total			
0 - 19	0	0	0	0	0	0	0	0	0	0			
20 - 24	0	0	0	0	0	0	0	0	0	0			
25 - 29	1	0	0	0	0	0	0	0	0	1			
30 - 34	1	0	0	0	0	0	0	0	0	1			
35 - 39	1	3	0	0	0	0	0	0	0	4			
40 - 44	4	4	3	0	0	0	0	0	0	11			
45 - 49	14	13	6	3	0	0	0	0	0	36			
50 - 54	120	30	15	8	3	0	1	0	0	177			
55 - 59	1,044	321	53	17	10	5	1	0	0	1,451			
60 - 64	3,452	1,984	631	57	13	8	4	1	0	6,150			
65 - 69	1,893	3,206	2,672	842	71	14	6	1	0	8,705			
70 - 74	745	1,533	2,004	2,390	944	18	10	5	3	7,652			
75+	633	734	1,065	1,619	2,609	1,484	920	228	58	9,350			
Total	7,908	7,828	6,449	4,936	3,650	1,529	942	235	61	33,538			

Section 4.8: Pension Benefit Recipients by Type of Benefit and Option Elected

Peace Officer / Firefighter

Amount of Monthly	Number of	Туре о	f Pension E	Benefit	Option Selected				
Amount of Monthly Pension Benefit	Recipients	1	2	3	1	2	3	4	5
\$ 1 - 300	52	18	34	0	37	6	0	2	7
301 – 600	175	109	66	0	93	40	23	7	12
601 – 900	176	99	76	1	103	41	10	12	10
901 – 1,200	168	93	75	0	108	30	16	7	7
1,201 – 1,500	178	113	64	1	103	39	20	7	9
1,501 – 1,800	167	122	45	0	91	43	22	7	4
1,801 - 2,100	154	104	48	2	71	41	32	5	5
2,101 - 2,400	225	170	54	1	102	68	32	13	10
2,401 - 2,700	197	168	25	4	75	67	37	12	6
2,701 - 3,000	228	203	23	2	72	99	35	14	8
3,001 - 3,300	282	248	30	4	95	110	55	11	11
3,301 - 3,600	238	209	26	3	84	95	34	15	10
3,601 - 3,900	191	173	15	3	66	84	27	10	4
3,901 - 4,200	202	193	7	2	58	91	36	13	4
4,200+	935	909	23	3	239	464	155	65	12
Total	3,568	2,931	611	26	1,397	1,318	534	200	119

Type of Pension Benefit

- 1. Regular Retirement
- 2. Survivor Payment
- 3. Disability

Option Selected

- 1. Whole Life Annuity
- 2. 75% Joint and Contingent Annuity
- 3. 50% Joint and Contingent Annuity
- 4. 66 2/3% Joint and Survivor Annuity
- 5. Level Income Option

Pension Benefit Recipients by Type of Benefit and Option Elected

Others

Amount of Monthly	Number of	Type	of Pension	Benefit	Option Selected					
Amount of Monthly Pension Benefit	Recipients	1	2	3	1	2	3	4	5	
\$ 1 - 300	2,100	1,543	556	1	1,022	384	279	63	352	
301 – 600	5,092	4,272	812	8	2,680	1,186	807	262	157	
601 – 900	4,248	3,529	707	12	2,241	1,030	674	180	123	
901 – 1,200	3,476	3,007	464	5	1,708	850	662	168	88	
1,201 – 1,500	2,939	2,571	351	17	1,429	770	551	116	73	
1,501 – 1,800	2,388	2,115	257	16	1,110	683	447	89	59	
1,801 – 2,100	2,018	1,810	191	17	923	549	390	96	60	
2,101 - 2,400	1,726	1,574	141	11	749	500	347	82	48	
2,401 - 2,700	1,461	1,349	96	16	629	420	299	62	51	
2,701 - 3,000	1,216	1,131	80	5	504	394	245	38	35	
3,001 - 3,300	1,035	984	45	6	412	332	222	42	27	
3,301 - 3,600	891	857	32	2	338	293	194	48	18	
3,601 - 3,900	760	731	26	3	297	265	147	36	15	
3,901 - 4,200	687	659	28	0	267	226	145	32	17	
4,200+	3,501	3,458	39	4	1,178	1,257	814	202	50	
Total	33,538	29,590	3,825	123	15,487	9,139	6,223	1,516	1,173	

Type of Pension Benefit

- 1. Regular Retirement
- 2. Survivor Payment
- 3. Disability

Option Selected

- 1. Whole Life Annuity
- 2. 75% Joint and Contingent Annuity
- 3. 50% Joint and Contingent Annuity
- 4. 66 2/3% Joint and Survivor Annuity
- 5. Level Income Option

Section 4.9: Pension Benefit Recipients Added to and Removed from Rolls

Peace Officer / Firefighter

	Ad	Added to Rolls		Remo	Removed from Rolls Rolls a			at End of Year	Percent Increase	Average
Year Ended	No.¹		Annual Pension Benefits	No. ¹		Annual Pension Benefits	No. ¹	Annual Pension Benefits	in Annual Pension Benefits	Annual Pension Benefit
June 30, 2020	164	\$	8,472,240	61	\$	1,078,932	3,568	\$ 136,413,796	5.7%	\$ 38,233
June 30, 2019	149		6,713,940	71		233,335	3,465	129,020,488	5.3%	37,235
June 30, 2018	153		7,002,504	81		2,573,694	3,387	122,539,883	3.7%	36,179
June 30, 2017	165		6,971,580	54		2,132,027	3,315	118,111,073	4.3%	35,629
June 30, 2016	137		6,618,744	49		1,594,392	3,204	113,271,520	4.6%	35,353
June 30, 2015	136		5,617,344	46		633,048	3,116	108,247,168	4.8%	34,739
June 30, 2014	109		4,270,620	50		(145,771)	3,026	103,262,870	4.5%	34,125
June 30, 2013	113		4,162,920	42		240,775	2,967	98,846,479	4.1%	33,315
June 30, 2012	179		5,246,271	41		(177,568)	2,896	94,924,334	6.1%	32,778
June 30, 2011	114		3,772,720	33		116,090	2,758	89,500,495	4.3%	32,451

¹ Numbers are estimated, and include other internal transfers.

Pension Benefit Recipients Added to and Removed from Rolls

Others

	Added to Rolls		Removed from Rolls		Rolls at End of Year		Percent Increase	Average
Year Ended	No. ¹	Annual Pension Benefits	No.¹	Annual Pension Benefits	No. ¹	Annual Pension Benefits	in Annual Pension Benefits	Annual Pension Benefit
June 30, 2020	1,472	\$ 42,340,608	779	\$ 9,911,423	33,538	\$ 772,395,881	4.4%	\$ 23,030
June 30, 2019	1,543	43,301,707	765	3,096,594	32,845	739,966,696	5.7%	22,529
June 30, 2018	1,708	46,316,673	673	10,533,376	32,067	699,761,583	5.4%	21,822
June 30, 2017	1,699	44,619,382	816	14,610,212	31,032	663,978,286	4.7%	21,398
June 30, 2016	1,780	44,409,702	660	12,099,362	30,149	633,969,116	5.4%	21,028
June 30, 2015	1,583	39,939,292	627	7,232,812	29,029	601,658,776	5.7%	20,726
June 30, 2014	1,778	44,823,611	603	3,011,383	28,073	568,952,296	7.9%	20,267
June 30, 2013	1,808	43,247,667	554	4,861,626	26,898	527,140,068	7.9%	19,598
June 30, 2012	1,679	37,855,250	636	5,344,239	25,644	488,754,027	7.1%	19,059
June 30, 2011	1,595	37,100,217	554	6,897,899	24,601	456,243,016	7.1%	18,546

¹ Numbers are estimated, and include other internal transfers.

Section 5: Basis of the Actuarial Valuation

Section 5.1: Summary of Plan Provisions

Effective Date

January 1, 1961, with amendments through June 30, 2020. Chapter 82, 1986 Session Laws of Alaska, created a two-tier retirement system. Members who were first hired under PERS before July 1, 1986 (Tier 1) are eligible for different benefits than members hired after June 30, 1986 (Tier 2). Chapter 4, 1996 Session Laws of Alaska created a third tier for members who were first hired after June 30, 1996 (Tier 3). Chapter 9, 2005 Session Laws of Alaska, closed the plan to new members hired after June 30, 2006.

Administration of Plan

The Commissioner of Administration or the Commissioner's designee is the administrator of the system. The Attorney General of the state is the legal counsel for the system and shall advise the administrator and represent the system in legal proceedings.

Prior to June 30, 2005, the Public Employees' Retirement Board prescribed policies and adopted regulations and performed other activities necessary to carry out the provisions of the system. The Alaska State Pension Investment Board, Department of Revenue, Treasury Division was responsible for investing PERS funds.

On July 27, 2005, Senate Bill 141, enacted as Chapter 9, 2005 Session laws of Alaska, replaced the Public Employees' Retirement Board and the Alaska State Pension Investment Board with the Alaska Retirement Management Board.

Employers Included

Currently there are 153 employers participating in PERS, including the State of Alaska and 152 political subdivisions and public organizations. Two additional political subdivisions participate in PERS for healthcare benefits only.

Membership

PERS membership is mandatory for all permanent full-time and part-time employees of the State of Alaska and participating political subdivisions and public organizations, unless they are specifically excluded by Alaska Statute or employer participation agreements. Employees participating in the University of Alaska's Optional Retirement Plan or other retirement plans funded by the State are not covered by PERS. Elected officials may waive PERS membership.

Certain members of the Alaska Teachers' Retirement System (TRS) are eligible for PERS retirement benefits for their concurrent elected public official service with municipalities. In addition, employees who work half-time in PERS and TRS simultaneously are eligible for half-time PERS and TRS credit.

Senate Bill 141, signed into law on July 27, 2005, closes the plan effective July 1, 2006, to new members first hired on or after July 1, 2006.

Credited Service

Permanent employees who work at least 30 hours a week earn full-time credit; part-time employees working between 15 and 30 hours a week earn partial credit based upon the number of hours worked. Members receiving PERS occupational disability benefits continue to earn PERS credit while disabled. Survivors who are receiving occupational death benefits continue to earn PERS service credit while occupational survivor benefits are being paid.

Members may claim other types of service, including:

- part-time State of Alaska service rendered after December 31, 1960, and before January 1, 1976;
- service with the State, former Territory of Alaska, or U.S. Government in Alaska before January 1, 1961;
- past Peace Officer, correctional officer, fire fighter, and special officer service after January 1, 1961;
- military service (not more than five years may be claimed);
- temporary service after December 31, 1960;
- · elected official service before January 1, 1981;
- · Alaska Bureau of Indian Affairs service;
- past service rendered by employees who worked half-time in PERS and TRS simultaneously;
- leave without pay service after June 13, 1987, while receiving Workers' Compensation;
- · Village Public Safety Officer service; and
- service as a temporary employee of the legislature before July 1, 1979, but this service must have been claimed no later than July 1, 2003, or by the date of retirement, if sooner (not more than ten years may be claimed).

Except for service before January 1, 1961, with the State, former Territory of Alaska, or U.S. Government in Alaska, contributions are required for all past service.

Past employment with participating political subdivisions that occurred before the employers joined PERS is creditable if the employers agree to pay the required contributions.

At the election of certain PERS members, certain service may be credited in the same fashion as members in TRS.

Members employed as dispatchers or within a state correctional facility may, at retirement, elect to convert their dispatcher or correctional facility service from "all other" service to Peace Officer/Firefighter service and retire under the 20-year retirement option. Members pay the full actuarial cost of conversion.

Employer Contributions

PERS employers contribute the amounts required, in addition to employees' contributions, to fund the benefits of the system.

The normal cost rate is a uniform rate for all participating employers (less the value of members' contributions).

The past service rate is a uniform rate for all participating employers to amortize the unfunded past service liability with payments that are a level percentage of payroll amount over a closed 25-year period starting June 30, 2014. Effective June 30, 2018, each future year's unfunded service liability is separately amortized on a level percent of pay basis over 25 years.

Employer rates cannot be less than the normal cost rate.

Pursuant to AS 39.35.255 effective July 1, 2008, each PERS employer will pay a simple uniform contribution rate of 22% of member payroll.

Additional State Contributions

Pursuant to AS 39.35.280 effective July 1, 2008, the State shall contribute an amount (in addition to the State contribution as an employer) that, when combined with the employer contribution of 22%, will be sufficient to pay the total contribution rate adopted by the Board.

Member Contributions

Mandatory Contributions: Peace Officer/Firefighter members are required to contribute 7.5% of their compensation; all Others contribute 6.75%. Those all Others who have elected to have their service calculated under TRS rules contribute 9.76% of their compensation. Members' contributions are deducted from gross wages before federal income taxes are withheld.

Contributions for Claimed Service: Member contributions are also required for most of the claimed service described above.

Voluntary Contributions: Members may voluntarily contribute up to 5% of their salary on an after-tax basis. Voluntary contributions are recorded in a separate account and are payable to the:

- a. member in lump sum payment upon termination of employment;
- b. member's beneficiary if the member dies; or
- c. member in a lump sum, life annuity, or payments over a designated period of time when the member retires.

Interest: Members' contributions earn 4.5% interest, compounded semiannually on June 30 and December 31.

Refund of Contributions: Terminated members may receive refunds of their member contribution accounts which includes their mandatory and voluntary contributions, indebtedness payments, and interest earned. Terminated members' accounts may be attached to satisfy claims under Alaska Statute 09.38.065, federal income tax levies, and valid Qualified Domestic Relations Orders.

Reinstatement of Contributions: Refunded accounts and the corresponding PERS service may be reinstated upon reemployment in PERS prior to July 1, 2010. Interest accrues on refunds until paid in full or members retire.

Retirement Benefits

Eligibility

- a. Members, including deferred vested members, are eligible for normal retirement at age 55 or early retirement at age 50 if they were hired before July 1, 1986 (Tier 1), and age 60 or early retirement at age 55 if they were hired on or after July 1, 1986 (Tiers 2 & 3). Additionally, they must have at least:
 - (i) five years of paid-up PERS service;
 - (ii) 60 days of paid-up PERS service as employees of the legislature during each of five legislative sessions and they were first hired by the legislature before May 30, 1987;
 - (iii) 80 days of paid-up PERS service as employees of the legislature during each of five legislative sessions and they were first hired by the legislature after May 29, 1987;
 - (iv) two years of paid-up PERS service and they are vested in TRS; or
 - (v) two years of paid-up PERS service and a minimum three years of TRS service to qualify for a public service benefit.
- b. Members may retire at any age when they have:
 - (i) 20 paid-up years of PERS Peace Officer/Firefighter service; or
 - (ii) 30 paid-up years of PERS "all other" or "elected official" service.

Benefit Type

Lifetime benefits are paid to members. Eligible members may receive normal, unreduced benefits when they (1) reach normal retirement age and complete the service required; or (2) satisfy the minimum service requirements under the "20 and out" or "30 and out" provisions. Members may receive early, actuarially reduced benefits when they reach early retirement age and complete the service required.

Members may select a joint and survivor option. Members who entered PERS prior to July 1, 1996 may also select a 66-2/3 last survivor option or a level income option. Under these options and early retirement, benefits are actuarially adjusted so that members receive the actuarial equivalents of their normal benefit amounts.

Benefit Calculations

Retirement benefits are calculated by multiplying the average monthly compensation (AMC) times credited PERS service times the percentage multiplier. The AMC is determined by averaging the salaries earned during the five highest (three highest for Peace Officer/Firefighter members or members hired prior to July 1, 1996) consecutive payroll years. Members must earn at least 115 days of credit in the last year worked to include it in the AMC calculation. PERS pays a minimum benefit of \$25.00 per month for each year of service when the calculated benefit is less.

The percentage multipliers for Peace Officer/Firefighter members are 2% for the first ten years of service and 2.5% for all service over ten years.

The percentage multipliers for all Others are 2% for the first ten years, 2.25% for the next ten years, and 2.5% for all remaining service earned on or after July 1, 1986. All service before that date is calculated at 2%.

Indebtedness

Members who terminate and refund their PERS contributions are not eligible to retire unless they return to PERS employment and pay back their refunds plus interest or accrue additional service which qualifies them for retirement. PERS refunds must be paid in full if the corresponding service is to count toward the minimum service requirements for retirement. Refunded PERS service is included in total service for the purpose of calculating retirement benefits. However, when refunds are not completely paid before retirement, benefits are actuarially reduced for life. Indebtedness balances may also be created when a member purchases qualified claimed service.

Reemployment of Retired Members

Retirement and retiree healthcare benefits are suspended while retired members are reemployed under PERS. During reemployment, members earn additional PERS service and contributions are withheld from their wages. A member who retired with a normal retirement benefit can elect to waive payment of PERS contributions. The waiver allows the member to continue receiving the retirement benefit during the period of reemployment. Members who elect the waiver option do not earn additional PERS service. The Waiver Option first became effective July 1, 2005 and applies to reemployment periods after that date. The Waiver Option is not available to members who retired early or under the Retirement Incentive Programs (RIPs). The Waiver Option is no longer available after June 30, 2009.

Members retired under the Retirement Incentive Programs (RIPs) who return to employment will:

- a. forfeit the three years of incentive credits that they received;
- b. owe PERS 150% of the benefits that they received for state and political subdivision members, and 110% for school district employees, under the 1996-2000 RIP, which may include costs for health insurance, excluding amounts that they paid to participate for the 1986 and 1989 RIPs. Under prior RIPs, the penalty is 110% of the benefits received; and

c. be charged 7% interest from the date that they are reemployed until their indebtedness is paid in full or they retire again. If the indebtedness is not completely paid, future benefits will be actuarially reduced for life.

Employers make contributions to the unfunded liability of the plan on behalf of rehired retired members at the rate the employer is making contributions to the unfunded liability of the plan for other members.

Postemployment Healthcare Benefits

Major medical benefits are provided to retirees and their surviving spouses by PERS for all employees hired before July 1, 1986 (Tier 1) and disabled retirees. Employees hired after June 30, 1986 (Tier 2) and their surviving spouses with five years of credited service (or ten years of credited service for those first hired after June 30, 1996 (Tier 3)) must pay the full monthly premium if they are under age sixty and will receive benefits paid by PERS if they are over age sixty. Tier 3 Members with between five and ten years of credited service must pay the full monthly premium regardless of their age. Tier 2 and Tier 3 Members with less than five years of credited service are not eligible for postemployment healthcare benefits. Tier 2 Members who are receiving a conditional benefit and are age eligible are eligible for postemployment healthcare benefits. In addition, Peace Officers and their surviving spouses with twenty-five years of Peace Officer membership service, Other employees and their surviving spouses with thirty years of membership service, and any disabled member receive benefits paid by PERS, regardless of their age or date of hire.

Medical, prescription drug, dental, vision and audio coverage is provided through the AlaskaCare Retiree Health Plan. Health plan provisions do not vary by retirement tier or age, except for Medicare coordination. Participants in dental, vision, and audio coverage pay a full self-supporting rate and those benefits are not included in this valuation.

Surviving spouses continue coverage only if a pension payment form that provided survivor benefits was elected. Alternate payees (i.e. individuals who are the subject of a domestic relations order or DRO) are allowed to participate in the plan, but must pay the full cost.

Where premiums are required prior to age 60, the valuation bases this payment upon the age of the retiree.

Participants in the defined benefit plan are covered under the following benefit design:

Plan Feature	Amounts	
Deductible (single/family)	\$150 / \$450	
Coinsurance (most services)	20%	
Outpatient surgery/testing	0%	
Maximum Out-of-Pocket (single/family, excluding deductible)	\$800 / \$2,400	
Rx Copays (generic/brand/mail-order), does not apply to OOP max	\$4 / \$8 / \$0	
Lifetime Maximum	\$2,000,000	

The plan coordinates with Medicare on a traditional Coordination of Benefits Method. Starting in 2019, the prescription drug coverage is through a Medicare Part D EGWP arrangement.

Disability Benefits

Monthly disability benefits are paid to permanently disabled members until they die, recover, or become eligible for normal retirement. Members are appointed to normal retirement on the first of the month after they become eligible.

Occupational Disability

Members are not required to satisfy age or service requirements to be eligible for occupational disability. Monthly benefits are equal to 40% of their gross monthly compensation on the date of their disability. Members on occupational disability continue to earn PERS service until they become eligible for normal retirement. Peace Officer/Firefighter members may elect to retain the disability benefit formula for the calculation of their normal retirement benefits.

Non-occupational Disability

Members must be vested (five paid up years of PERS service) to be eligible for non-occupational disability benefits. Monthly benefits are calculated based on the member's average monthly compensation and PERS service on the date of termination from employment because of disability. Members do not earn PERS service while on non-occupational disability.

Death Benefits

Monthly death benefits may be paid to a spouse or dependent children upon the death of a member. If monthly benefits are not payable under the occupational and non-occupational death provisions, the designated beneficiary receives the lump sum benefit described below.

Occupational Death

When an active member (vested or non-vested) dies from occupational causes, a monthly survivor's pension may be paid to the spouse. The pension equals 40% of the member's gross monthly compensation on the date of death or disability, if earlier. If there is no spouse, the pension may be paid to the member's dependent children. On the member's normal retirement date, the benefit converts to a normal retirement benefit. The normal benefit is based on the member's salary on the date of death and service, including service accumulated from the date of the member's death to the normal retirement date. Survivors of Peace Officer/Firefighter members receive the greater of 50% of the member's gross monthly compensation on the date of death or disability, or 75% of the member's monthly normal retirement benefit (including service projected to Normal Retirement). If the member is unmarried with no children, a refund of contributions is payable to the estate.

Death after Occupational Disability

When a member dies while occupationally disabled, benefits are paid as described above in Occupational Death.

Non-Occupational Death

When a vested member dies from non-occupational causes, the surviving spouse may elect to receive a monthly 50% joint and survivor benefit or a lump sum benefit. The monthly benefit is calculated on the member's average monthly compensation and PERS service at the time of termination or death.

Lump Sum Non-Occupational Death Benefit

Upon the death of a member who has less than one year of service, the designated beneficiary receives the member's contribution account, which includes mandatory and voluntary contributions, indebtedness payments, and interest earned. If the member has more than one year of PERS service or is vested, the beneficiary also receives \$1,000 and \$100 for each year of PERS service.

Death After Retirement

When a retired member dies, the designated beneficiary receives the member's contribution account, less any benefits already paid and the member's last benefit check. If the member selected a survivor option at retirement, the eligible spouse receives continuing, lifetime monthly benefits.

Postretirement Pension Adjustments

Postretirement pension adjustments (PRPAs) are granted annually to eligible benefit recipients when the consumer price index (CPI) for urban wage earners and clerical workers for Anchorage increases during the preceding calendar year. PRPAs are calculated by multiplying the recipient's base benefit including past PRPAs, but excluding the Alaska COLA, times:

- a. 75% of the CPI increase in the preceding calendar year or 9%, whichever is less, if the recipient is at least age 65 or on PERS disability; or
- b. 50% of the CPI increase in the preceding calendar year or 6%, whichever is less, if the recipient is at least age 60, or under age 60 if the recipient has been receiving benefits for at least five years.

Ad hoc PRPAs, up to a maximum of 4%, may be granted to eligible recipients who were first hired before July 1, 1986 (Tier 1) if the CPI increases and the funded ratio is at least 105%.

In a year where an ad-hoc PRPA is granted, eligible recipients will receive the higher of the two calculations.

Alaska Cost-of-Living Allowance (COLA)

Eligible benefit recipients who reside in Alaska receive an Alaska COLA equal to 10% of their base benefits or \$50, whichever is more. The following benefit recipients are eligible:

- a. members who first entered PERS before July 1, 1986 (Tier 1) and their survivors;
- b. members who first entered PERS after June 30, 1986 (Tiers 2 & 3) and their survivors if they are at least age 65; and
- c. all disabled members.

Changes in Benefit Provisions Valued Since the Prior Valuation

There were no changes in benefit provisions since the prior valuation.

Section 5.2: Description of Actuarial Methods and Valuation Procedures

The funding method used in this valuation was adopted by the Board in October 2006. Changes in methods were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017. The asset smoothing method used to determine valuation assets was changed effective June 30, 2014.

Benefits valued are those delineated in Alaska State statutes as of the valuation date. Changes in State statutes effective after the valuation date are not taken into consideration in setting the assumptions and methods.

Actuarial Cost Method

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method, level percent of pay.

Effective June 30, 2018, the Board adopted a layered UAAL amortization method: Layer #1 equals the sum of (i) the UAAL at June 30, 2018 based on the 2017 valuation, plus (ii) the FY18 experience gain/loss. Layer #1 is amortized over the remainder of the 25-year closed period that was originally established in 2014¹. Layer #2 equals the change in UAAL at June 30, 2018 due to the experience study and EGWP implementation. Layer #2 is amortized over a separate closed 25-year period starting in 2018. Future layers will be created each year based on the difference between actual and expected UAAL occurring that year, and will be amortized over separate closed 25-year periods. The UAAL amortization continues to be on a level percent of pay basis. State statutes allow the contribution rate to be determined on payroll for all members, defined benefit and defined contribution member payroll combined.

Projected pension and postemployment healthcare benefits were determined for all active members. Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year from the assumed entry age to the assumed retirement age were applied to the projected benefits to determine the normal cost (the portion of the total cost of the plan allocated to the current year under the method). The normal cost is determined by summing intermediate results for active members and determining an average normal cost rate which is then related to the total payroll of active members. The actuarial accrued liability for active members (the portion of the total cost of the plan allocated to prior years under the method) was determined as the excess of the actuarial present value of projected benefits over the actuarial present value of future normal costs.

The actuarial accrued liability for retired members and their beneficiaries currently receiving benefits, terminated vested members and disabled members not yet receiving benefits was determined as the actuarial present value of the benefits expected to be paid. No future normal costs are payable for these members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of plan assets measured on the valuation date.

Under this method, experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

¹ Layer #1 is referred to as "initial amount" in Sections 1.2 and 1.3.

Valuation of Assets

The actuarial asset value was reinitialized to equal Fair Value of Assets as of June 30, 2014. Beginning in FY15, the asset valuation method recognizes 20% of the gain or loss each year, for a period of five years. All assets are valued at fair value. Assets are accounted for on an accrued basis and are taken directly from financial statements audited by KPMG LLP.

Changes in Methods Since the Prior Valuation

There were no changes in the asset or valuation methods since the prior valuation.

Valuation of Retiree Medical and Prescription Drug Benefits

This section outlines the detailed methodology used in the internal model developed by Buck to calculate the initial per capita claims cost rates for the PERS postemployment healthcare plan. Note that the methodology reflects the results of our annual experience rate update for the period from July 1, 2019 to June 30, 2020.

Base claims cost rates are incurred healthcare costs expressed as a rate per member per year. Ideally, claims cost rates should be derived for each significant component of cost that can be expected to require differing projection assumptions or methods (i.e., medical claims, prescription drug claims, administrative costs, etc). Separate analysis is limited by the availability and historical credibility of cost and enrollment data for each component of cost. This valuation reflects non-prescription claims separated by Medicare status, including eligibility for free Part A coverage. Prescription costs are analyzed separately as in prior valuations. Administrative costs are assumed in the final per capita claims cost rates used for valuation purposes, as described below. Analysis to date on Medicare Part A coverage is limited since Part A claim data is not available by individual, nor is this status incorporated into historical claim data.

Benefits

Medical, prescription drug, dental, vision and audio coverage is provided through the AlaskaCare Retiree Health Plan and is available to employees of the State and subdivisions who meet retirement criteria based on the retirement plan tier in effect at their date of hire. Health plan provisions do not vary by retirement tier or age, except for Medicare coordination for those Medicare-eligible. Dental, vision and audio claims (DVA) are excluded from data analyzed for this valuation because those are retiree-pay all benefits where rates are assumed to be self-supporting. Buck relies upon rates set by a third-party for the DVA benefits. Buck reviewed historical rate-setting information and views contribution rate adjustments made are not unreasonable.

Administration and Data Sources

The plan was administered by Wells Fargo Insurance Services (acquired by HealthSmart, in January 2012) from July 1, 2009 through December 31, 2013 and by Aetna effective January 1, 2014.

Claims incurred for the period from July 2018 through June 2020 (FY19 through FY20) were provided by the State of Alaska from reports extracted from their data warehouse, which separated claims by Medicare status. Monthly enrollment data for the same period was provided by Aetna.

Aetna also provided census information identifying Medicare Part B only participants. These participants are identified when hospital claims are denied by Medicare; Aetna then flags that participant as a Part B only participant. Buck added newly identified participants to our list of Medicare Part B only participants. Buck assumes that once identified as Part B only, that participant remains in that status until we are notified otherwise.

Aetna provided a snapshot file as of July 1, 2020 of retirees and dependents that included a coverage level indicator. The monthly enrollment data includes double coverage participants. These are participants whereby both the retiree and spouse are retirees from the State and both are reflected with Couple coverage in the enrollment. In this case, such a couple would show up as four members in the

monthly enrollment (each would be both a retiree and a spouse). As a result, the snapshot census file was used to adjust the total member counts in the monthly enrollment reports to estimate the number of unique participants enrolled in coverage. Based on the snapshot files from the last two valuations, the total member count in the monthly enrollment reports needs to be reduced by approximately 13% to account for the number of participants with double coverage.

Aetna does not provide separate experience by Medicare status in standard reporting so the special reports mentioned above from the data warehouse were used this year to obtain that information and incorporate it into the per capita rate development for each year of experience (with corresponding weights applied in the final per capita cost).

Methodology

Buck projected historical claim data to FY21 for retirees using the following summarized steps:

- 1. Develop historical annual incurred claim cost rates an analysis of medical costs was completed based on claims information and enrollment data provided by the State of Alaska and Aetna for each year in the experience period of FY19 through FY20.
 - Costs for medical services and prescriptions were analyzed separately, and separate trend rates
 were developed to project expected future medical and prescription costs for the valuation year
 (e.g. from the experience period up through FY21).
 - Because the reports provided reflected incurred claims, no additional adjustment was needed to determine incurred claims to be used in the valuation.
 - An offset for costs expected to be reimbursed by Medicare was incorporated beginning at age 65. Alaska retirees who do not have 40 quarters of Medicare-covered compensation do not qualify for Medicare Part A coverage free of charge. This is a relatively small and closed group. Medicare was applied to State employment for all employees hired after March 31, 1986. For the "no-Part A" individuals who are required to enroll in Medicare Part B, the State is the primary payer for hospital bills and other Part A services. Claim experience is not available separately for participants with both Medicare Parts A and B and those with Part B only. For Medicare Part B only participants, a lower average claims cost was applied to retirees covered by both Medicare Part A and B vs. retirees covered only by Medicare Part B based upon manual rate models that estimate the Medicare covered proportion of medical costs. To the extent that no-Part A claims can be isolated and applied strictly to the appropriate closed group, actuarial accrued liability will be more accurate.
 - Based on census data received from Aetna, less than 1% of the current retiree population was identified as having coverage only under Medicare Part B. We assume that 5% of actives hired before April 1, 1986 and current retirees who are not yet Medicare eligible will not be eligible for Medicare Part A.
 - Based upon a reconciliation of valuation census data to the snapshot eligibility files provided by Aetna as of July 1, 2019, and July 1, 2020, Buck adjusted member counts used for duplicate records where participants have double coverage; i.e. primary coverage as a retiree and secondary coverage as the covered spouse of another retiree. This is to reflect the total cost per distinct individual/member which is then applied to distinct members in the valuation census.
 - Buck understands that pharmacy claims reported do not reflect rebates. Based on actual
 pharmacy rebate information provided by Aetna for years through 2018 and Optum for January
 2019 through June 2020, rebates were assumed to be 17% of prescription drug claims for FY19
 and 19.5% of prescription drug claims for FY20.
- 2. Develop estimated EGWP reimbursements Segal provided estimated 2021 EGWP subsidies, developed with the assistance of OptumRx. These amounts are applicable only to Medicare-eligible participants.

- 3. Adjust for claim fluctuation, anomalous experience, etc. explicit adjustments are often made for anticipated large claims or other anomalous experience. FY19 and FY20 experience were compared to assess the impact of COVID-19 and whether an adjustment to FY20 claims was indicated for use in the June 30, 2020 valuation. A material decrease in medical claims during March 2020 to June 2020 was experienced due to COVID-19. Therefore, an adjustment was made for those months to adjust for the decrease that is not expected to continue in future years. There was an observed spike in prescription drug claims in March 2020; however, the FY20 prescription drug experience appears reasonable to use without adjustment for COVID-19. To adjust for the decrease in medical claims due to COVID-19 during the last 4 months of FY20, the per capita cost during the first 8 months was used as the basis for estimating claims that would have occurred in the absence of COVID-19. Due to group size and demographics, we did not make any additional large claim adjustments. We do blend both Alaska plan-specific and national trend factors as described below. Buck compared data utilized to lag reports and quarterly plan experience presentations provided by the State and Aetna to assess accuracy and reasonableness of data.
- 4. Trend all data points to the projection period project prior years' experience forward to FY21 for retiree benefits on an incurred claim basis. Trend factors derived from historical Alaska-specific experience and national trend factors are shown in the table in item 5 below.
- 5. Apply credibility to prior experience adjust prior year's data by assigning weight to recent periods, as shown at the right of the table below. The Board approved a change in the weighting of experience periods beginning with the June 30, 2017 valuation as outlined below. Note also that we averaged projected plan costs using Alaska-specific trend factors and national trend factors, assigning 75% weight to Alaska-specific trends and 25% to national trends:

Alaska-Specific and National Average Weighted Trend from Experience Period to Valuation Year					
Experience Period Medical Prescription Weighting Fac					
FY19 to FY20	7.3% Pre-Medicare / 4.6% Medicare	1.2%	50%		
FY20 to FY21	6.3% Pre-Medicare / 5.2% Medicare	7.6%	50%		

Trend assumptions used for rate development are assessed annually and as additional/improved reporting becomes available, we will incorporate into rate development as appropriate.

6. Develop separate administration costs – no adjustments were made for internal administrative costs. Third party retiree plan administration fees for FY21 are based upon total fees projected to 2021 by Segal based on actual FY20 fees. The annual per participant per year administrative cost rate for medical and prescription benefits is \$449.

Healthcare Reform

Healthcare Reform legislation passed on March 23, 2010 included several provisions with potential implications for the State of Alaska Retiree Health Plan liability. Buck evaluated the impact due to these provisions.

Because the State plan is retiree-only, and was in effect at the time the legislation was enacted, not all provisions of the health reform legislation apply to the State plan. Unlimited lifetime benefits and dependent coverage to age 26 are two of these provisions. We reviewed the impact of including these provisions, but there was no decision made to adopt them, and no requirement to do so.

Because Transitional Reinsurance fees are only in effect until 2016, we excluded these for valuation purposes.

The Further Consolidated Appropriations Act, 2020 passed in December 2019 repealed several healthcare-related taxes, including the Cadillac Tax.

The Tax Cuts and Jobs Act passed in December 2017 included the elimination of the individual mandate penalty and changed the inflation measure for purposes of determining the limits for the High Cost Excise Tax to use chained CPI. It is our understanding the law does not directly impact other provisions of the ACA. While the nullification of the ACA's individual mandate penalty does not directly impact employer group health plans, it could contribute to the destabilization of the individual market and increase the number of uninsured. Such destabilization could translate to increased costs for employers. We have considered this when setting our healthcare cost trend assumptions and will continue to monitor this issue.

We have not identified any other specific provisions of healthcare reform or its potential repeal that would be expected to have a significant impact on the measured obligation. We will continue to monitor legislative activity.

Data

In accordance with actuarial standards, we note the following specific data sources and steps taken to value retiree medical benefits:

The Division of Retirement and Benefits provided pension valuation census data, which for people currently in receipt of healthcare benefits was supplemented by coverage data from the healthcare claims administrator (Aetna).

Certain adjustments and assumptions were made to prepare the data for valuation:

- Some records provided on the Aetna data were associated with a participant social security number not listed on the RIN-to-SSN translation file. We reconciled those participants with the pension valuation data as either a surviving spouse or a retiree in the appropriate plan based on account structure information in the Aetna data.
- All records provided with retiree medical coverage on the Aetna data were included in this valuation and we relied on the Aetna data as the source of medical coverage for current retirees and their dependents.
- Some records in the Aetna data were duplicates due to the double coverage (i.e. coverage as a retiree
 and as a spouse of another retiree) allowed under the plan. Records were adjusted for these members
 so that each member was only valued once. Any additional value of the double coverage (due to
 coordination of benefits) is small and reflected in the per capita costs.
- Covered children included in the Aetna data were valued until age 23, unless disabled. We assumed that those dependents over 23 were only eligible and valued due to being disabled.
- For individuals included in the pension data expecting a future pension, we valued health benefits starting at the same point that the pension benefit is assumed to start.

We are not aware of any other data issues that would be expected to have a material impact on the results and there are no unresolved matters related to the data.

The chart below shows the basis of setting the per capita claims cost assumption, which includes both PERS and TRS.

	Medical				Prescription Drugs (Rx)			
	Pre	-Medicare		Medicare	Pre-Medicare		Medicare	
A. Fiscal 2019								
1. Incurred Claims	\$ 2	30,731,518	\$	80,855,220	\$	63,846,605	\$ 1	183,281,273
2. Adjustments for Rx Rebates		<u>0</u>		<u>0</u>		(10,853,923)	1	(31,157,816)
3. Net incurred claims	\$ 2	30,731,518	\$	80,855,220	\$	52,992,682	\$ 1	152,123,456
4. Average Enrollment		20,625		42,843		20,625		42,843
5. Claim Cost Rate (3) / (4)		11,187		1,887		2,569		3,551
6. Trend to Fiscal 2021		1.141		1.101		1.089		1.089
7. Fiscal 2021 Incurred Cost Rate (5) x (6)	\$	12,762	\$	2,077	\$	2,798	\$	3,867
B. Fiscal 2020								
1. Incurred Claims	\$ 2	29,531,664	\$	89,497,345	\$	64,442,660	\$ 1	188,022,328
2. Adjustments for Rx Rebates		<u>0</u>		<u>0</u>		(12,566,319)	1	(36,664,354)
3. Net incurred claims	\$ 2	29,531,664	\$	89,497,345	\$	51,876,341	\$ 1	151,357,974
Average Enrollment		19,354		44,965		19,354		44,965
5. Claim Cost Rate (3) / (4)		11,860		1,990		2,680		3,366
6. Trend to Fiscal 2021		1.063		1.052		1.076		1.076
7. Fiscal 2021 Incurred Cost Rate (5) x (6)	\$	12,609	\$	2,094	\$	2,885	\$	3,623
	Medical		al		Prescription		n Drugs (Rx)	
	Pre	-Medicare		Medicare	Pı	re-Medicare	ľ	Medicare
C. Incurred Cost Rate by Fiscal Year								
1. Fiscal 2019 A.(7)		12,762		2,077		2,798		3,867
2. Fiscal 2020 B.(7)		12,609		2,094		2,885		3,623
D. Weighting by Fiscal Year								
1. Fiscal 2019		50%		50%		50%		50%
2. Fiscal 2020		50%		50%		50%		50%
E. Fiscal 2021 Incurred Cost Rate								
1. Rate at Average Age C x D	\$	12,685	\$	2,086	\$	2,842	\$	3,745
Average Aging Factor		0.826		1.263		0.838		1.121
3. Rate at Age 65 (1) / (2)	\$	15,360	\$	1,651 	\$	3,393	\$	3,340
F. Development of Part A&B and Part B								
Only Cost from Pooled Rate Above								
Part A&B Average Enrollment				44,568				
Part B Only Average Enrollment				398				
3. Total Medicare Average Enrollment B(4)				44,965				
Cost ratio for those with Part B only to those with Parts A&B				3.300				
5. Factor to determine cost for those with Parts A&B				1 020				
(2) / (3) x (4) + (1) / (3) x 1.00				1.020				
6. Medicare per capita cost for all				Ψ				
participants: E(3)			\$	1,651	_			
7. Cost for those eligible for Parts A&B: (6)	/ (5)		\$	1,618				
8. Cost for those eligible for Part B only: (7)	x (4)		\$	5,340				

Following the development of total projected costs, a distribution of per capita claims cost was developed. This was accomplished by allocating total projected costs to the population census used in the valuation. The allocation was done separately for each of prescription drugs and medical costs for the Medicare eligible and pre-Medicare populations. The allocation weights were developed using participant counts by age and assumed morbidity and aging factors. Results were tested for reasonableness based on historical trend and external benchmarks for costs paid by Medicare.

Below are the results of this analysis:

Distribution of Per Capita Claims Cost by Age for the Period July 1, 2020 through June 30, 2021

Age	Medical and Medicare Parts A & B	Medical and Medicare Part B Only	Prescription Drug	Medicare EGWP Subsidy
45	\$ 9,374	\$ 9,374	\$ 2,072	\$ 0
50	10,605	10,605	2,461	0
55	11,999	11,999	2,923	0
60	13,576	13,576	3,149	0
65	1,618	5,340	3,340	1,003
70	1,876	6,191	3,688	1,107
75	2,174	7,177	4,071	1,223
80	2,401	7,923	3,971	1,192

Section 5.3: Summary of Actuarial Assumptions

The demographic and economic assumptions used in the June 30, 2020 valuation are described below. Unless noted otherwise, these assumptions were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017.

Investment Return

7.38% per year, net of investment expenses.

Salary Scale

Salary scale rates based upon the 2013-2017 actual experience (see Table 1).

Inflation – 2.50% per year.

Productivity – 0.25% per year.

Payroll Growth

2.75% per year (inflation + productivity).

Total Inflation

Total inflation as measured by the Consumer Price Index for urban and clerical workers for Anchorage is assumed to increase 2.50% annually.

Mortality (Pre-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

RP-2014 employee table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Deaths are assumed to result from occupational causes 75% of the time for Peace Officer/Firefighters, and 40% of the time for Others.

Mortality (Post-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

91% of male and 96% of female rates of RP-2014 healthy annuitant table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Turnover

Select and ultimate rates based upon the 2013-2017 actual experience (see Tables 2a and 2b).

Disability

Incidence rates based upon the 2013-2017 actual experience (see Table 3).

Post-disability mortality in accordance with the RP-2014 disabled table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement. Disabilities are assumed to be occupational 75% of the time for Peace Officer/Firefighters, and 40% of the time for Others.

Retirement

Retirement rates based upon the 2013-2017 actual experience (see Tables 4a and 4b).

Deferred vested members are assumed to retire at their earliest unreduced retirement date.

The modified cash refund annuity is valued as a three-year certain and life annuity.

Spouse Age Difference

Males are assumed to be three years older than their wives. Females are assumed to be two years younger than husbands.

Percent Married for Pension

For Others, 75% of male members and 70% of female members are assumed to be married. For Peace Officer/Firefighters, 85% of male members and 60% of female members are assumed to be married.

Dependent Spouse Medical Coverage Election

Applies to members who do not have double medical coverage. For Others, 65% of male members and 60% of female members are assumed to be married and cover a dependent spouse. For Peace Officer/Firefighters, 75% of male members and 50% of female members are assumed to be married and cover a dependent spouse.

Dependent Children

- · Pension: None
- Healthcare: Benefits for dependent children have been valued only for members currently covering their dependent children. These benefits are only valued through the dependent children's age 23 (unless the child is disabled).

Contribution Refunds

For Others, 5% of terminating members with vested benefits are assumed to have their contributions refunded.

For Peace Officers/Firefighters, 10% of terminating members with vested benefits are assumed to have their contributions refunded.

100% of those with non-vested benefits are assumed to have their contributions refunded.

Imputed Data

Data changes from the prior year which are deemed to have an immaterial impact on liabilities and contribution rates are assumed to be correct in the current year's client data. Non-vested terminations with appropriate refund dates are assumed to have received a full refund of contributions. Active members with missing salary and service are assumed to be terminated with status based on their vesting percentage.

Active Rehire Assumption

The Normal Cost used for determining contribution rates and in the projections includes a rehire assumption to account for anticipated rehires. The Normal Cost shown in the report includes the following assumptions (which were developed based on the five years of rehire loss experience through June 30, 2017). For projections, these assumptions were assumed to grade to zero uniformly over a 20-year period.

Pension: 18.77%Healthcare: 17.09%

Re-Employment Option

All re-employed retirees are assumed to return to work under the Standard Option.

Active Data Adjustment

No adjustment was made to reflect participants who terminate employment before the valuation date and are subsequently rehired after the valuation date.

Alaska Cost-of-Living Adjustments (COLA)

Of those benefit recipients who are eligible for the Alaska COLA, 70% of Others and 65% of Peace Officers/Firefighters are assumed to remain in Alaska and receive the COLA.

Postretirement Pension Adjustment (PRPA)

50% and 75% of assumed inflation, or 1.25% and 1.875% respectively, is valued for the annual automatic PRPA as specified in the statute.

Expenses

The investment return assumption is net of investment expenses. The Normal Cost as of June 30, 2020 was increased by the following amounts for administrative expenses (for projections, the percent increase was assumed to remain constant in future years):

Pension: \$7,223,000Healthcare: \$4,934,000

Part-Time Status

Part-time employees are assumed to earn 1.00 years of credited service per year for Peace Officer/Firefighter and 0.75 years of credited service per year for Other members.

Service

Total credited service is provided by the State. This service is assumed to be the only service that should be used to calculate benefits. Additionally, the State provides claimed service (including Bureau of Indian Affairs Service). Claimed service is used for vesting and eligibility purposes as described in Section 5.1.

Final Average Earnings

Final Average Earnings is provided on the data for active members. This amount is used as a minimum in the calculation of the average earnings in the future.

Per Capita Claims Cost

Sample claims cost rates adjusted to age 65 for FY21 medical and prescription drugs are shown below:

	Me	edical	Prescription Drugs		
Pre-Medicare	\$	15,360	\$	3,393	
Medicare Parts A & B	\$	1,618	\$	3,340	
Medicare Part B Only	\$	5,340	\$	3,340	
Medicare Part D – EGWP		N/A	\$	1,003	

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2021 fiscal year (July 1, 2020 – June 30, 2021).

The EGWP subsidy is assumed to increase in future years by the trend rates shown on the following pages. No future legislative changes or other events are anticipated to impact the EGWP subsidy. If any legislative or other changes occur in the future that impact the EGWP subsidy (which could either increase or decrease the plan's Actuarial Accrued Liability), those changes will be evaluated and quantified when they occur.

Third Party Administrator Fees

\$449 per person per year; assumed to increase at 4.5% per year.

Medicare Part B Only

We assume that 5% of actives hired before April 1, 1986 and current retirees who are not yet Medicare eligible will not be eligible for Medicare Part A.

Healthcare Cost Trend

The table below shows the rate used to project the cost from the shown fiscal year to the next fiscal year. For example, 6.5% is applied to the FY21 pre-Medicare medical claims costs to get the FY22 medical claims costs.

	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY21	6.5%	5.4%	7.5%
FY22	6.3%	5.4%	7.1%
FY23	6.1%	5.4%	6.8%
FY24	5.9%	5.4%	6.4%
FY25	5.8%	5.4%	6.1%
FY26	5.6%	5.4%	5.7%
FY27-FY40	5.4%	5.4%	5.4%
FY41	5.3%	5.3%	5.3%
FY42	5.2%	5.2%	5.2%
FY43	5.1%	5.1%	5.1%
FY44	5.1%	5.1%	5.1%
FY45	5.0%	5.0%	5.0%
FY46	4.9%	4.9%	4.9%
FY47	4.8%	4.8%	4.8%
FY48	4.7%	4.7%	4.7%
FY49	4.6%	4.6%	4.6%
FY50+	4.5%	4.5%	4.5%

For the June 30, 2014 valuation and later, the updated Society of Actuaries' Healthcare Cost Trend Model is used to project medical and prescription drug costs. This model estimates trend amounts that are projected out for 80 years. The model has been populated with assumptions that are specific to the State of Alaska.

Aging Factors

Age	Medical	Prescription Drugs
0 – 44	2.0%	4.5%
45 – 54	2.5%	3.5%
55 – 64	2.5%	1.5%
65 - 74	3.0%	2.0%
75 – 84	2.0%	-0.5%
85 – 94	0.3%	-2.5%
95+	0.0%	0.0%

Retired Member Contributions for Medical Benefits

Currently contributions are required for PERS members who are under age 60 and have less than 30 years of service (25 for Peace Officer/Firefighter). Eligible Tier 1 members are exempt from contribution requirements. Annual FY21 contributions based on monthly rates shown below for calendar 2021 are assumed based on the coverage category for current retirees. The composite rate shown is used for current active and inactive members in Tier 2 or 3 who are assumed to retire prior to age 60 with less than 30 years of service and who are not disabled. For dependent children, we value 1/3 of the annual retiree contribution to estimate the per child rate based upon the assumed number of children in rates where children are covered.

Coverage Category	Calendar 2021 Annual Contribution		Calendar 2021 Monthly Contribution		Calendar 2020 Monthly Contribution	
Retiree Only	\$	8,448	\$	704	\$	741
Retiree and Spouse	\$	16,896	\$	1,408	\$	1,482
Retiree and Child(ren)	\$	11,940	\$	995	\$	1,047
Retiree and Family	\$	20,388	\$	1,699	\$	1,788
Composite	\$	12,552	\$	1,046	\$	1,101

Trend Rate for Retired Member Medical Contributions

The table below shows the rate used to project the retired member medical contributions from the shown fiscal year to the next fiscal year. For example, 0.0% is applied to the FY21 retired member medical contributions to get the FY22 retired member medical contributions.

Trend Assumptions				
FY21	0.0%			
FY22	0.0%			
FY23+	4.0%			

Graded trend rates for retired member medical contributions are consistent with the rates used for the June 30, 2019 valuation. Actual FY21 retired member medical contributions are reflected in the valuation.

Healthcare Participation

100% of system paid members and their spouses are assumed to elect healthcare benefits as soon as they are eligible. 20% of non-system paid members and their spouses are assumed to elect healthcare benefits as soon as they are eligible.

Changes in Assumptions Since the Prior Valuation

Healthcare claim costs are updated annually as described in Section 5.2. Retired member contributions were updated to reflect the 5% decrease from CY20 to CY21. The amounts included in the Normal Cost for administrative expenses were changed from \$6,839,000 to \$7,223,000 for pension and from \$3,744,000 to \$4,934,000 for healthcare (based on the most recent two years of actual administrative expenses paid from plan assets).

Table 1: Salary Scales

Peace Officer / Firefighter		Oth	ers
Years of Service	Percent Increase	Years of Service	Percent Increase
0	7.75%	0	6.75%
1	7.25%	1	6.25%
2	6.75%	2	5.75%
3	6.25%	3	5.25%
4	5.75%	4	4.75%
5	5.25%	5	4.25%
6	4.75%	6	3.75%
7	4.25%	7	3.65%
8	3.75%	8	3.55%
9	3.65%	9	3.45%
10	3.55%	10	3.35%
11	3.45%	11	3.25%
12	3.35%	12	3.15%
13	3.25%	13	3.05%
14	3.15%	14	2.95%
15	3.05%	15	2.85%
16	2.95%	16	2.75%
17	2.85%	17	2.75%
18+	2.75%	18+	2.75%

Table 2a: Turnover Rates for Peace Officer / Firefighter

Select Rates during the First 5 Years of Employment

Years of Service	Male	Female
0	15.00%	15.00%
1	12.00%	8.00%
2	7.20%	6.40%
3	5.67%	5.60%
4	6.48%	7.20%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	4.70%	6.80%	39	2.04%	2.98%
23	4.46%	6.80%	40	1.68%	3.39%
24	4.22%	6.80%	41	1.67%	3.37%
25	3.98%	6.80%	42	1.67%	3.36%
26	3.74%	6.80%	43	1.71%	3.33%
27	3.50%	6.80%	44	1.76%	3.31%
28	3.32%	6.63%	45	1.81%	3.28%
29	3.14%	6.46%	46	1.85%	3.25%
30	2.96%	6.29%	47	1.90%	3.23%
31	2.79%	6.12%	48	2.22%	3.19%
32	2.61%	5.95%	49	2.53%	3.15%
33	2.50%	5.36%	50	3.18%	6.42%
34	2.39%	4.77%	51	4.24%	6.32%
35	2.28%	4.18%	52	4.24%	6.19%
36	2.17%	3.60%	53	4.24%	6.04%
37	2.06%	3.01%	54	4.24%	3.00%
38	2.05%	2.99%	55+	3.00%	2.00%

Table 2b: Turnover Rates for Others

Select Rates during the First 5 Years of Employment

Hire Age Under 35				Hire Age Over	35
Years of Service	Male	Female	Years of Service		Female
0	29.00%	29.00%	0	20.00%	20.00%
1	16.25%	20.00%	1	12.00%	15.00%
2	13.00%	16.00%	2	10.00%	12.50%
3	10.40%	12.80%	3	8.50%	10.00%
4	8.45%	10.40%	4	8.50%	9.00%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	11.40%	12.99%	39	5.47%	5.23%
23	10.83%	12.21%	40	4.86%	5.65%
24	10.26%	11.43%	41	4.71%	5.51%
25	9.69%	10.65%	42	4.56%	5.38%
26	9.12%	9.87%	43	4.50%	5.19%
27	8.55%	9.09%	44	4.44%	4.99%
28	8.30%	8.72%	45	4.39%	4.80%
29	8.05%	8.34%	46	4.33%	4.60%
30	7.80%	7.97%	47	4.27%	4.41%
31	7.54%	7.60%	48	4.26%	4.40%
32	7.29%	7.23%	49	4.24%	4.39%
33	6.99%	6.88%	50	3.63%	4.45%
34	6.69%	6.53%	51	3.60%	4.43%
35	6.39%	6.17%	52	3.56%	4.40%
36	6.10%	5.82%	53	3.52%	4.37%
37	5.80%	5.47%	54	4.17%	6.20%
38	5.63%	5.35%	55+	3.00%	5.00%

Table 3: Disability Rates

	Peace Officer / Firefighter			ers
Age	Male	Female	Male	Female
< 23	0.0179%	0.0112%	0.0327%	0.0376%
23	0.0244%	0.0153%	0.0360%	0.0400%
24	0.0310%	0.0194%	0.0392%	0.0424%
25	0.0374%	0.0234%	0.0425%	0.0448%
26	0.0440%	0.0275%	0.0456%	0.0472%
27	0.0505%	0.0316%	0.0489%	0.0496%
28	0.0526%	0.0329%	0.0501%	0.0510%
29	0.0548%	0.0343%	0.0513%	0.0524%
30	0.0570%	0.0356%	0.0524%	0.0538%
31	0.0591%	0.0370%	0.0536%	0.0554%
32	0.0612%	0.0383%	0.0548%	0.0568%
33	0.0634%	0.0397%	0.0566%	0.0586%
34	0.0657%	0.0411%	0.0584%	0.0606%
35	0.0679%	0.0425%	0.0602%	0.0624%
36	0.0702%	0.0439%	0.0620%	0.0644%
37	0.0724%	0.0453%	0.0638%	0.0662%
38	0.0757%	0.0473%	0.0669%	0.0696%
39	0.0789%	0.0493%	0.0701%	0.0728%
40	0.0822%	0.0514%	0.0734%	0.0762%
41	0.0854%	0.0534%	0.0765%	0.0794%
42	0.0886%	0.0554%	0.0797%	0.0826%
43	0.0977%	0.0611%	0.0879%	0.0908%
44	0.1066%	0.0667%	0.0962%	0.0990%
45	0.1157%	0.0723%	0.1043%	0.1072%
46	0.1247%	0.0780%	0.1125%	0.1154%
47	0.1337%	0.0836%	0.1208%	0.1236%
48	0.1462%	0.0914%	0.1329%	0.1360%
49	0.1588%	0.0993%	0.1451%	0.1484%
50	0.1714%	0.1071%	0.1572%	0.1608%
51	0.1839%	0.1150%	0.1694%	0.1734%
52	0.1965%	0.1228%	0.1815%	0.1858%
53	0.2294%	0.1434%	0.2132%	0.2168%
54	0.2624%	0.1640%	0.2450%	0.2478%

Table 4a: Retirement Rates for Peace Officer / Firefighter

	Reduced		Unreduced		
Age	Male	Female	Male	Female	
< 47	N/A	N/A	8.80%	6.00%	
47	N/A	N/A	8.80%	15.00%	
48	N/A	N/A	14.30%	15.00%	
49	N/A	N/A	14.30%	15.00%	
50	5.00%	5.00%	16.50%	15.00%	
51	5.00%	7.00%	16.50%	15.00%	
52	7.00%	7.00%	20.35%	15.00%	
53	7.00%	7.00%	20.35%	15.00%	
54	7.00%	35.00%	20.35%	25.00%	
55	7.00%	8.00%	27.50%	20.00%	
56	7.00%	8.00%	27.50%	15.00%	
57	7.00%	8.00%	27.50%	15.00%	
58	7.00%	8.00%	27.50%	15.00%	
59	20.00%	20.00%	27.50%	15.00%	
60	N/A	N/A	33.00%	25.00%	
61	N/A	N/A	27.50%	20.00%	
62	N/A	N/A	27.50%	30.00%	
63	N/A	N/A	27.50%	50.00%	
64	N/A	N/A	22.00%	50.00%	
65	N/A	N/A	22.00%	50.00%	
66	N/A	N/A	27.50%	50.00%	
67	N/A	N/A	55.00%	50.00%	
68	N/A	N/A	55.00%	50.00%	
69	N/A	N/A	55.00%	50.00%	
70+	N/A	N/A	100.00%	100.00%	

Table 4b: Retirement Rates for Others

	Reduced		Unreduced		
Age	Male	Female	Male	Female	
< 50	N/A	N/A	11.00%	11.00%	
50	6.00%	8.00%	33.00%	38.50%	
51	6.00%	8.00%	35.75%	38.50%	
52	9.00%	8.00%	35.75%	38.50%	
53	6.00%	8.00%	35.75%	38.50%	
54	20.00%	15.00%	38.50%	38.50%	
55	6.00%	6.00%	33.00%	33.00%	
56	6.00%	6.00%	22.00%	22.00%	
57	6.00%	6.00%	22.00%	19.80%	
58	6.00%	6.00%	22.00%	19.80%	
59	15.00%	20.00%	22.00%	19.80%	
60	N/A	N/A	22.00%	23.10%	
61	N/A	N/A	22.00%	22.00%	
62	N/A	N/A	22.00%	22.00%	
63	N/A	N/A	22.00%	22.00%	
64	N/A	N/A	22.00%	22.00%	
65	N/A	N/A	24.75%	28.60%	
66	N/A	N/A	27.50%	28.60%	
67	N/A	N/A	22.00%	24.20%	
68	N/A	N/A	24.75%	24.20%	
69	N/A	N/A	27.50%	24.20%	
70	N/A	N/A	27.50%	24.20%	
71	N/A	N/A	27.50%	24.20%	
72	N/A	N/A	27.50%	27.50%	
73	N/A	N/A	27.50%	27.50%	
74	N/A	N/A	27.50%	38.50%	
75	N/A	N/A	55.00%	55.00%	
76	N/A	N/A	55.00%	55.00%	
77	N/A	N/A	55.00%	55.00%	
78	N/A	N/A	55.00%	55.00%	
79	N/A	N/A	55.00%	55.00%	
80 +	N/A	N/A	100.00%	100.00%	

Section 6: Actuarial Standard of Practice No. 51

Funding future retirement benefits prior to when those benefits become due involves assumptions regarding future economic and demographic experience. These assumptions are applied to calculate actuarial liabilities, current contribution requirements, and the funded status of the plan. However, to the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the plan. Understanding the risks to the funding of the plan is important.

Actuarial Standard of Practice No. 51 (ASOP 51)¹ requires certain disclosures of potential risks to the plan and provides useful information for intended users of actuarial reports that determine plan contributions or evaluate the adequacy of specified contribution levels to support benefit provisions.

Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

It is important to note that not all risk is negative, but all risk should be understood and accepted based on knowledge, judgement, and educated decisions. Future measurements may deviate in ways that produce positive or negative financial impacts to the plan.

In the actuary's professional judgment, the following risks may reasonably be anticipated to significantly affect the pension plan's future financial condition and contribution requirements.

- Investment Risk potential that the investment return will be different than the 7.38% expected in the
 actuarial valuation
- Contribution Risk potential that the contribution actually made will be different than the actuarially determined contribution
- Long-Term Return on Investment Risk potential that changes in long-term capital market assumptions or the plan's asset allocation will create the need to update the long-term return on investment assumption
- Longevity Risk potential that participants live longer than expected compared to the valuation mortality assumptions
- Salary Increase Risk potential that future salaries will be different than expected in the actuarial valuation
- Inflation Risk potential that the consumer price index (CPI) for urban wage earners and clerical workers for Anchorage is different than the 2.5% assumed in the valuation
- Other Demographic Risk potential that other demographic experience will be different than expected

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the plan. **This list is not all-inclusive**; it is an attempt to identify the more significant risks and how those risks might affect the results shown in this report.

Note that ASOP 51 does not require the actuary to evaluate the ability or willingness of the plan sponsor to make contributions to the plan when due, or to assess the likelihood or consequences of potential future changes in law. In addition, this valuation report is not intended to provide investment advice or to provide guidance on the management or reduction of risk.

¹ ASOP 51 does not apply to the healthcare portion of the plan. Accordingly, all figures in this section relate to the pension portion.

Assessment of Risks

Investment Risk

Plan costs are very sensitive to the market return.

- Any return on assets lower than assumed will increase costs.
- The plan uses an actuarial value of assets that smooths gains and losses on market returns over a five-year period to help control some of the volatility in costs due to investment risk.
- Historical experience of actual returns is shown in Section 2.4 of this report. This historical experience illustrates how returns can vary over time.

Contribution Risk

There is a risk to the plan when the employer's and/or State's actual contribution amount and the actuarially determined contribution differ.

- If the actual contribution is lower than the actuarially determined contribution, the plan may not be sustainable in the long term.
- Any underpayment of the contribution will increase future contribution amounts to help pay off the additional Unfunded Actuarial Accrued Liability associated with the underpayment(s).
- As long as the Board consistently adopts the actuarially determined contributions, this risk is mitigated
 due to Alaska statutes requiring the State to contribute additional funds necessary to pay the total
 contributions adopted by the Board.

Long-Term Return on Investment Risk

Inherent in the long-term return on investment assumption is the expectation that the current rate will be used until the last benefit payment of the plan is made. There is a risk that sustained changes in economic conditions, changes in long-term future capital market assumptions, or changes to the plan's asset allocation will necessitate an update to the long-term return on investment assumption used.

- Under a lower long-term return on investment assumption, less investment return is available to pay plan benefits. This may lead to a need for increased employer contributions.
- The liabilities will be higher at a lower assumed rate of return because future benefits will have a lower discount rate applied when calculating the present value.
- A 1% decrease in the long-term return on investment assumption will increase actuarial accrued liability by approximately 12%.
- This risk may be increased due to the plan being closed to new entrants. As the plan continues to
 mature, the magnitude of negative cash flow discussed in the Plan Maturity Measures later in this
 section will grow, thereby creating a need for more liquid assets that may not garner the same longterm return as currently assumed.

Longevity Risk

Plan costs will be increased as participants are expected to live longer.

- Benefits are paid over a longer lifetime when life expectancy is expected to increase. The longer duration of payments leads to higher liabilities.
- Health care has been improving, which affects the life expectancy of participants. As health care improves, leading to longer life expectancies, costs to the plan could increase.

- The mortality assumption for the plan mitigates this risk by assuming future improvement in mortality. However, any improvement in future mortality greater than that expected by the current mortality assumption would lead to increased costs for the plan.
- The Postretirement Pension Adjustments and Alaska Cost-of-Living Allowance increase longevity risk because members who live longer than expected will incur more benefit payment increases than expected and therefore increase costs.

Salary Increase Risk

Plan costs will be increased if actual salary increases are larger than expected.

- Higher-than-expected salary increases will produce higher benefits.
- The higher benefits may be partially offset by increased employee contributions due to higher salaries.
- If future payroll grows at a rate different than assumed, contributions as a percentage of payroll will be affected.

Inflation Risk

Plan costs will be increased if the actual CPI for Anchorage is greater than the 2.5% assumed in the valuation.

- Retirement benefits will be greater than expected if the CPI is greater than the assumed rate, which will increase costs.
- This risk is mitigated by the 75% and 50% of CPI provisions and the 9% and 6% maximums.
- This risk is also mitigated by the age and time in payment requirements to receive an increase.
- Inflation risk may be associated with the interaction of inflation with other assumptions, but this is not significant as a standalone assumption, and therefore is considered as part of the associated assumption risk instead of being discussed here.

Other Demographic Risk

The plan is subject to risks associated with other demographic assumptions (e.g., retirement, termination, and retired members remaining in Alaska assumptions). Differences between actual and expected experience for these assumptions tend to have less impact on the overall costs of the plan. The demographic assumptions used in the valuation are re-evaluated regularly as part of the four-year experience studies to ensure the assumptions are consistent with long-term expectations.

Historical Information

Monitoring certain information over time may help understand risks faced by the plan. Historical information is included throughout this report. Some examples are:

- Funded Ratio History shown in the Executive Summary illustrates how the plan's funded status (comparison of actuarial accrued liabilities to actuarial value of assets) has changed over time.
- Section 1.6 shows historical analysis of financial experience including how contribution rates have changed over time.
- Section 2.4 shows the volatility of asset returns over time.
- Section 4 includes various historical information showing how member census data has changed over time.

Plan Maturity Measures

There are certain measures that may aid in understanding the significant risks to the plan.

Rat	tio of Retired Liability to Total Liability (\$'s in \$000's)	June 30, 2019	June 30, 2020
1.	Retiree and Beneficiary Accrued Liability	\$ 10,076,528	\$ 10,472,466
2.	Total Accrued Liability	\$ 15,039,180	\$ 15,279,525
3.	Ratio, (1) ÷ (2)	67.0%	68.5%

A high percentage of liability concentrated on participants in pay status indicates a mature plan (often a ratio above 60% - 65%). Because the plan was closed to new entrants in 2006, we expect the percentage in item #3 to continue to increase over time. An increasing percentage may indicate a need for a less risky asset allocation, which may lead to a lower long-term return on asset assumption and increased costs. Higher percentages may also indicate greater investment risk as benefit payments may be greater than contributions creating an increased reliance on investment returns. This ratio should be monitored each year in the future.

Ra	tio of Cash Flow to Assets (\$'s in \$000's)	FYE	June 30, 2019	FYE .	June 30, 2020
1.	Contributions	\$	498,067	\$	504,029
2.	Benefit Payments		848,019		895,523
3.	Cash Flow, (1) - (2)	\$	(349,952)	\$	(391,494)
4.	Fair Value of Assets	\$	9,489,405	\$	9,469,161
5.	Ratio, (3) ÷ (4)		(3.7%)		(4.1%)

When this cash flow ratio is negative, more cash is being paid out than deposited in the trust. Negative cash flow indicates the trust needs to rely on investment returns to cover benefit payments and / or may need to invest in more liquid assets to cover the benefit payments. More liquid assets may not generate the same returns as less liquid assets, which can increase the investment risk. Currently, the low magnitude of the ratio implies there may already be enough liquid assets to cover the benefit payments, less investment return is needed to cover the shortfall, or only a small portion of assets will need to be converted to cash. Therefore, the investment risk is likely not amplified at this time. However, due to the plan being closed, we expect this measure to become increasingly negative over time. This maturity measure should be monitored in the future.

Contribution Volatility (\$'s in \$000's)	June 30, 2019	June 30, 2020
1. Fair Value of Assets	\$ 9,489,405	\$ 9,469,161
2. DB/DCR Payroll	\$ 2,347,306	\$ 2,373,078
3. Asset to Payroll Ratio, (1) ÷ (2)	404.3%	399.0%
4. Accrued Liability	\$ 15,039,180	\$ 15,279,525
5. Liability to Payroll Ratio, (4) ÷ (2)	640.7%	643.9%

Plans that have higher asset-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to investment return. For example, a plan with an asset-to-payroll ratio of 10% may experience twice the contribution volatility due to investment return volatility than a plan with an asset-to-payroll ratio of 5%. Plans that have higher liability-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to changes in liability. For example, if an assumption change increases the liability of two plans by the same percent, the plan with a liability-to-payroll ratio of 10% may experience twice the contribution volatility than a plan with a liability-to-payroll ratio of 5%.

Glossary of Terms

Actuarial Accrued Liability

Total accumulated cost to fund pension or postemployment benefits arising from service in all prior years.

Actuarial Cost Method

Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension or postemployment plan for a group of plan members to the years of service that give rise to that cost.

Actuarial Present Value of Projected Benefits

Amount which, together with future interest, is expected to be sufficient to pay all future benefits.

Actuarial Valuation

Study of probable amounts of future pension or postemployment benefits and the necessary amount of contributions to fund those benefits.

Actuary

Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.

GASB 67 and 68

Governmental Accounting Standards Board Statement Number 67 amends Number 25 effective for the fiscal year beginning after June 15, 2013 and defines new financial reporting requirements for public pension plans.

Governmental Accounting Standards Board Statement Number 68 amends Number 27 effective for fiscal years beginning after June 15, 2014 and defines new accounting and financial reporting requirements for employers sponsoring public pension plans.

GASB 74 and 75

Governmental Accounting Standards Board Statement Number 74 amends Number 43 effective for the fiscal year beginning after June 15, 2016 and defines new financial reporting requirements for public postemployment benefit plans. Governmental Accounting Standards Board Statement Number 75 amends Number 45 effective for fiscal years beginning after June 15, 2017 and defines new accounting and financial reporting requirements for employers sponsoring public postemployment benefit plans.

Normal Cost

That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.

Rate Payroll

Members' earnings used to determine contribution rates.

Unfunded Actuarial Accrued Liability (UAAL)

The portion of the actuarial accrued liability not offset by plan assets.

Valuation Payroll

Members' earnings used to determine Normal Cost and Actuarial Accrued Liability.

Vested Benefits

Benefits which are unconditionally guaranteed regardless of employment.



State of Alaska

Public Employees'
Retirement System
Defined Contribution
Retirement Plan

For Occupational Death and Disability and Retiree Medical Benefits

Actuarial Valuation Report As of June 30, 2020

May 2021



May 20, 2021

State of Alaska
The Alaska Retirement Management Board
The Department of Revenue, Treasury Division
The Department of Administration, Division of Retirement and Benefits
P.O. Box 110203
Juneau, AK 99811-0203

Certification of Actuarial Valuation

Dear Members of The Alaska Retirement Management Board, The Department of Revenue and The Department of Administration:

This report summarizes the annual actuarial valuation results of the State of Alaska Public Employees' Retirement System Defined Contribution Retirement (PERS DCR) Plan as of June 30, 2020 performed by Buck Global, LLC (Buck). This report is an update to the draft report dated January 7, 2021, reflecting minor wording changes.

The actuarial valuation is based on financial information provided in the financial statements audited by KPMG LLP, member data provided by the Division of Retirement and Benefits, and medical enrollment data provided by the healthcare claims administrator (Aetna), as summarized in this report. The benefits considered are those delineated in Alaska statutes effective June 30, 2020. The actuary did not verify the data submitted, but did perform tests for consistency and reasonableness.

All costs, liabilities and other factors under PERS DCR were determined in accordance with generally accepted actuarial principles and procedures. An actuarial cost method is used to measure the actuarial liabilities which we believe is reasonable. Buck is solely responsible for the actuarial data and actuarial results presented in this report. This report fully and fairly discloses the actuarial position of PERS DCR as of June 30, 2020.

PERS DCR is funded by Employer Contributions in accordance with the funding policy adopted by the Alaska Retirement Management Board (Board). The funding objective for PERS DCR is to pay required contributions that remain level as a percent of PERS DCR compensation. The Board has also established a funding policy objective that the required contributions be sufficient to pay the Normal Costs of active plan members, plan expenses, and amortize the Unfunded Actuarial Accrued Liability as a level percent of PERS DCR compensation over closed layered 25-year periods. This objective is currently being met and is projected to continue to be met as required by the Alaska State statutes. Absent future gains/losses, actuarially determined contributions are expected to remain level as a percent of pay and the overall funded status is expected to remain at or above 100%.

The Board and staff of the State of Alaska may use this report for the review of the operations of PERS DCR. Use of this report, for any other purpose or by anyone other than the Board or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, you should ask Buck to review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without the review by Buck.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. In particular, retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the plan and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience under the plan. The actuary performs an analysis of plan experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience. The last full experience analysis was performed for the period July 1, 2013 to June 30, 2017. Based on that experience study, the Board adopted new assumptions effective beginning with the June 30, 2018 valuation to better reflect expected future experience. Based on our annual analysis of recent claims experience, changes were made to the per capita claims cost rates effective June 30, 2020 to better reflect expected future healthcare experience. A summary of the actuarial assumptions and methods used in this actuarial valuation is shown in Sections 4.2 and 4.3. We certify that the assumptions and methods described in Sections 4.2 and 4.3 of this report meet the requirements of all applicable Actuarial Standards of Practice.

Governmental Accounting Standards Board (GASB) Statement No. 74 (GASB 74) was effective for PERS DCR beginning with fiscal year ending June 30, 2017, and GASB 75 was effective beginning with fiscal year ending June 30, 2018. Separate GASB 74 and GASB 75 reports have been prepared.

Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) applies to actuaries performing funding calculations related to a pension plan. ASOP 51 does not apply to actuaries performing services in connection with other post-employment benefits, such as medical benefits. Accordingly, ASOP 51 does not apply to the retiree medical portion of PERS DCR. We also believe ASOP 51 does not apply to the occupational death and disability portion of PERS DCR. Therefore, information related to ASOP 51 is not included in this report. However, it may be beneficial to review the ASOP 51 information provided in the PERS valuation report for information on risks that may also relate to the occupational death and disability benefits provided by this plan.

Use of Models

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to an internally developed model that applies applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal model are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts

within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal model, extra checking and review are completed. Significant changes to the internal model that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

Buck used manual rate models to determine relative plan values for the defined benefit (DB) retiree medical plan and the DCR retiree medical plan, and to reflect the different Medicare coordination methods between the two plans. The manual rate models are intended to provide benchmark data and pricing capabilities, calculate per capita costs, and calculate actuarial values of different commercial health plans. Buck relied on the models, which were developed using industry data by actuaries and consultants at OptumInsight.

COVID-19

The potential impact of the ongoing COVID-19 pandemic on costs and liabilities was considered and an adjustment was made in setting the medical per capita claims cost assumption. FY20 medical claims were adjusted for a COVID-19 related decline in claims during the last four months (March – June) of FY20. A more detailed explanation on these adjustments is shown in Sections 4.2 and 4.3 and in the valuation report for the DB plan.

This report was prepared under my supervision and in accordance with all applicable Actuarial Standards of Practice. I am a Fellow of the Society of Actuaries, an Enrolled Actuary, a Fellow of the Conference of Consulting Actuaries, and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

I am available to discuss this report with you at your convenience. I can be reached at 602-803-6174.

Respectfully submitted,

Q.LKQ

David J. Kershner, FSA, EA, MAAA, FCA

Principal Buck

The undersigned actuary is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms his qualification to render opinions in such matters in accordance with the Qualification Standards of the American Academy of Actuaries.

Scott Young, FSA, EA, MAAA, FCA

Scott Young

Director Buck

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Executive Summary

Overview

The State of Alaska Public Employees' Retirement System Defined Contribution Retirement (PERS DCR) Plan provides occupational death & disability and retiree medical benefits to eligible members hired after June 30, 2006 or who have elected participation in this plan. The Commissioner of the Department of Administration is responsible for administering the plan. The Alaska Retirement Management Board has fiduciary responsibility over the assets of the plan. This report presents the results of the actuarial valuation of PERS DCR as of the valuation date of June 30, 2020.

Purpose

An actuarial valuation is performed on the plan annually as of the end of the fiscal year. The main purposes of the actuarial valuation detailed in this report are:

- 1. To determine the Employer contribution necessary to meet the Board's funding policy for the plan;
- 2. To disclose the funding assets and liability measures as of the valuation date;
- 3. To review the current funded status of the plan and assess the funded status as an appropriate measure for determining actuarially determined contributions;
- 4. To compare actual and expected experience under the plan during the last fiscal year; and
- 5. To report trends in contributions, assets, liabilities, and funded status over the last several years.

The actuarial valuation provides a "snapshot" of the funded position of PERS DCR based on the plan provisions, membership data, assets, and actuarial methods and assumptions as of the valuation date.

Funded Status

Where presented, references to "funded ratio" and "unfunded actuarial accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

Fund	ded Status as of June 30 (\$'s in 000's)	2019		2020	
Оссі	upational Death & Disability				
a.	Actuarial Accrued Liability	\$ 9,774	\$	10,634	
b.	Valuation Assets	 36,701		43,029	
C.	Unfunded Actuarial Accrued Liability, (a) - (b)	\$ (26,927)	\$	(32,395)	
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	375.5%		404.6%	
e.	Fair Value of Assets	\$ 36,525	\$	42,091	
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	373.7%		395.8%	

1

Fund	ed Status as of June 30 (\$'s in 000's)	2019	2020
Retir	ee Medical		
a.	Actuarial Accrued Liability	\$ 124,946	\$ 150,701
b.	Valuation Assets	 118,783	 144,747
C.	Unfunded Actuarial Accrued Liability, (a) - (b)	\$ 6,163	\$ 5,954
d.	Funded Ratio based on Valuation Assets, (b) \div (a)	95.1%	96.0%
e.	Fair Value of Assets	\$ 118,238	\$ 141,569
f.	Funded Ratio based on Fair Value of Assets, (e) \div (a)	94.6%	93.9%
Total			
a.	Actuarial Accrued Liability	\$ 134,720	\$ 161,335
b.	Valuation Assets	 155,484	 187,77 <u>6</u>
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	\$ (20,764)	\$ (26,441)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	115.4%	116.4%
e.	Fair Value of Assets	\$ 154,763	\$ 183,660
f.	Funded Ratio based on Fair Value of Assets, (e) \div (a)	114.9%	113.8%

The key reasons for the change in the funded status are explained below. The funded status for healthcare benefits is not necessarily an appropriate measure to confirm that assets are sufficient to settle health plan obligations as there are no available financial instruments for purchase. Future experience is likely to vary from assumptions so there is potential for actuarial gains or losses.

1. Investment Experience

The approximate FY20 investment return based on fair value of assets was 4.3% compared to the expected investment return of 7.38% (net of investment expenses of approximately 0.30%). This resulted in a loss of approximately \$5,003,000 to the plan from investment experience. The asset valuation method recognizes 20 percent of this loss (\$1,001,000) this year and an additional 20 percent in each of the next 4 years. In addition, 20 percent of the FY16 investment loss, 20 percent of the FY17 investment gain, 20 percent of the FY18 investment loss and 20 percent of the FY19 investment loss were recognized this year. The approximate FY20 asset return based on actuarial value of assets was 6.4% compared to the expected asset return of 7.38% (net of investment expenses).

2. Salary Increases

Salary increases for continuing active members during FY20 were higher than anticipated based on the valuation assumptions, resulting in a liability loss of approximately \$25,000.

3. Demographic Experience

The number of active members increased 4.7% from 21,902 at June 30, 2019 to 22,923 at June 30, 2020. The average age of active members increased from 40.96 to 41.21 and average credited service increased from 4.33 to 4.66 years.

The demographic experience gains/losses are shown on page 4.

4. Retiree Medical Claims Experience

Please refer to the State of Alaska Public Employees' Retirement System (PERS) Defined Benefit Plan Actuarial Valuation Report as of June 30, 2020 for a full description of the assumptions and costs of the retiree medical plan. Adjustments to these costs and assumptions are described in this report.

The recent claims experience described in Section 4.2 of this report (Section 5.2 of the PERS report) created an actuarial gain of approximately \$7,863,000. This gain included an update to the medical and prescription drug relative value factors (described in Section 4.1) this year. In addition, the 0.2% annual trend rate adjustment factor between the DB and DCR plans was removed, which resulted in an actuarial loss of approximately \$7,485,000.

5. Changes in Methods Since the Prior Valuation

There were no changes in actuarial methods since the prior valuation.

6. Changes in Assumptions Since the Prior Valuation

Healthcare claim costs are updated annually as described in Section 4.2. The medical and prescription drug relative value factors were updated this year. In addition, the 0.2% annual trend rate adjustment factor between the DB and DCR plans was removed. The amounts included in Normal Cost for administrative expenses were updated based on the last two years of actual administrative expenses paid from plan assets. There were no other changes in actuarial assumptions since the prior valuation.

7. Changes in Benefit Provisions Since the Prior Valuation

There have been no changes in benefit provisions valued since the prior valuation.

Comparative Summary of Contribution Rates

Occi	upational Death & Disability	FY 2022	FY 2023
Peac	e Officer/Firefighter		
a.	Employer Normal Cost Rate	0.68%	0.68%
b.	Past Service Cost Rate	<u>(0.18)%</u>	<u>(0.19)%</u>
C.	Total Employer Contribution Rate, (a) + (b), not less than (a)	0.68%	0.68%
<u>Othe</u>	e <u>rs</u>		
a.	Employer Normal Cost Rate	0.31%	0.30%
b.	Past Service Cost Rate	<u>(0.14)%</u>	<u>(0.16)%</u>
C.	Total Employer Contribution Rate, (a) + (b), not less than (a)	0.31%	0.30%
Retir	ree Medical	FY 2022	FY 2023
a.	Employer Normal Cost Rate	1.02%	1.05%
b.	Past Service Cost Rate	<u>0.05%</u>	0.05%
C.	Total Employer Contribution Rate, (a) + (b), not less than (a)	1.07%	1.10%
Tota		FY 2022	FY 2023
Peac	e Officer/Firefighter		
a.	Employer Normal Cost Rate	1.70%	1.73%
b.	Past Service Cost Rate	<u>0.05%</u>	<u>0.05%</u>
c.	Total Employer Contribution Rate, (a) + (b), not less than (a)	1.75%	1.78%
<u>Othe</u>	<u>ers</u>		
a.	Employer Normal Cost Rate	1.33%	1.35%
b.	Past Service Cost Rate	<u>0.05%</u>	0.05%
C.	Total Employer Contribution Rate, (a) + (b), not less than (a)	1.38%	1.40%

The exhibit below shows the historical Board-adopted employer contribution rates for PERS DCR.

		Total Employer Contribution Rate				
Valuation Date	Fiscal Year	Occupational Death & Disability (PF / Others)	Retiree Medical	Total (PF / Others)		
June 30, 2008	FY11	1.18% / 0.31%	0.55%	1.73% / 0.86%		
June 30, 2009	FY12	0.97% / 0.11%	0.51%	1.48% / 0.62%		
June 30, 2010	FY13	0.99% / 0.14%	0.48%	1.47% / 0.62%		
June 30, 2011	FY14	1.14% / 0.20%	0.48%	1.62% / 0.68%		
June 30, 2012	FY15	1.06% / 0.22%	1.66%	2.72% / 1.88%		
June 30, 2013	FY16	1.05% / 0.22%	1.68%	2.73% / 1.90%		
June 30, 2014	FY17	0.49% / 0.17%	1.18%	1.67% / 1.35%		
June 30, 2015	FY18	0.43% / 0.16%	1.03%	1.46% / 1.19%		
June 30, 2016	FY19	0.76% / 0.26%	0.94%	1.70% / 1.20%		
June 30, 2017	FY20	0.72% / 0.26%	1.32%	2.04% / 1.58%		
June 30, 2018	FY21	0.70% / 0.31%	1.27%	1.97% / 1.58%		
June 30, 2019	FY22	0.68% / 0.31%	1.07%	1.75% / 1.38%		
June 30, 2020	FY23	TBD	TBD	TBD		

Summary of Actuarial Accrued Liability Gain/(Loss)

The following table shows the FY20 gain/(loss) on actuarial accrued liability as of June 30, 2020 (\$'s in 000's):

	C	Occupational Death & Disability		Retiree Medical	Total
Retirement Experience	\$	0	\$	329	\$ 329
Termination Experience		(118)		985	867
Disability Experience		2,496		354	2,850
Active Mortality Experience		1,792		2	1,794
Inactive Mortality Experience		(17)		241	224
Salary Increases		(25)		N/A	(25)
New Entrants		(139)		(1,301)	(1,440)
Rehires		(36)		(3,327)	(3,363)
Per Capita Claims Costs ¹		N/A		7,863	7,863
Elimination of 0.2% Annual Trend Rate Adjustment		N/A		(7,485)	(7,485)
Miscellaneous ²		573	_	531	 1,104
Total	\$	4,526	\$	(1,808)	\$ 2,718

¹ Includes the estimated impact of COVID-19 on claims experience during FY20.

² Includes the effects of various data changes that are typical when new census data is received for the annual valuation, the effects of the differences between expected and actual benefit payments, and other items that do not fit neatly into any of the other categories.

Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost (\$'s in 000's)

Peace Officer / Firefighter

As of June 30, 2020	Present Value of Projected Benefits		Actuarial Accrued (Past Service) Liability		
Active Members					
Occupational Death Benefits	\$	3,463	\$	10	
Occupational Disability Benefits		11,017		3,192	
Medical and Prescription Drug Benefits		38,413		19,303	
Medicare Part D Subsidy		(6,709)		(3,402)	
Subtotal	\$	46,184	\$	19,103	
Benefit Recipients					
Survivor Benefits	\$	396	\$	396	
Disability Benefits		4,420		4,420	
Medical and Prescription Drug Benefits		606		606	
Medicare Part D Subsidy		(93)		(93)	
Subtotal	\$	5,329	\$	5,329	
Total	\$	51,513	\$	24,432	
Total Occupational Death & Disability	\$	19,296	\$	8,018	
Total Retiree Medical, Net of Part D Subsidy	\$	32,217	\$	16,414	
Total Retiree Medical, Gross of Part D Subsidy	\$	39,019	\$	19,909	
As of June 30, 2020			Noi	mal Cost	
Active Members					
Occupational Death Benefits			\$	447	
Occupational Disability Benefits				933	
Medical and Prescription Drug Benefits				2,137	
Medicare Part D Subsidy				(372)	
Subtotal			\$	3,145	
Administrative Expense Load					
Occupational Death & Disability			\$	0	
Retiree Medical				5	
Subtotal			\$	5	
Total			\$	3,150	
Total Occupational Death & Disability			\$	1,380	
Total Retiree Medical, Net of Part D Subsidy			\$	1,770	
Total Retiree Medical, Gross of Part D Subsidy			\$	2,142	

Section 1.1: Actuarial Liabilities and Normal Cost (\$'s in 000's)

Others

As of June 30, 2020	ent Value of cted Benefits	Actuarial Accrue (Past Service) Liability		
Active Members				
Occupational Death Benefits	\$ 8,675	\$	579	
Occupational Disability Benefits	15,388		1,421	
Medical and Prescription Drug Benefits	261,701		161,739	
Medicare Part D Subsidy	 (49,640)		(30,824)	
Subtotal	\$ 236,124	\$	132,915	
Benefit Recipients				
Survivor Benefits	\$ 0	\$	0	
Disability Benefits	616		616	
Medical and Prescription Drug Benefits	4,176		4,176	
Medicare Part D Subsidy	 (804)		(804)	
Subtotal	\$ 3,988	\$	3,988	
Total	\$ 240,112	\$	136,903	
Total Occupational Death & Disability	\$ 24,679	\$	2,616	
Total Retiree Medical, Net of Part D Subsidy	\$ 215,433	\$	134,287	
Total Retiree Medical, Gross of Part D Subsidy	\$ 265,877	\$	165,915	
As of June 30, 2020		No	rmal Cost	
Active Members				
Occupational Death Benefits		\$	1,379	
Occupational Disability Benefits			2,374	
Medical and Prescription Drug Benefits			16,512	
Medicare Part D Subsidy			(3,115)	
Subtotal		\$	17,150	
Administrative Expense Load				
Occupational Death & Disability		\$	1	
Retiree Medical			15	
Subtotal		\$	16	
Total		\$	17,166	
Total Occupational Death & Disability		\$	3,754	
Total Retiree Medical, Net of Part D Subsidy		\$	13,412	
Total Retiree Medical, Gross of Part D Subsidy		\$	16,527	

Section 1.1: Actuarial Liabilities and Normal Cost (\$'s in 000's)

All Members

As of June 30, 2020	ent Value of cted Benefits	(Pa	rial Accrued st Service) Liability
Active Members			
Occupational Death Benefits	\$ 12,138	\$	589
Occupational Disability Benefits	26,405		4,613
Medical and Prescription Drug Benefits	300,114		181,042
Medicare Part D Subsidy	 (56,349)		(34,226)
Subtotal	\$ 282,308	\$	152,018
Benefit Recipients			
Survivor Benefits	\$ 396	\$	396
Disability Benefits	5,036		5,036
Medical and Prescription Drug Benefits	4,782		4,782
Medicare Part D Subsidy	(897)		(897)
Subtotal	\$ 9,317	\$	9,317
Total	\$ 291,625	\$	161,335
Total Occupational Death & Disability	\$ 43,975	\$	10,634
Total Retiree Medical, Net of Part D Subsidy	\$ 247,650	\$	150,701
Total Retiree Medical, Gross of Part D Subsidy	\$ 304,896	\$	185,824
As of June 30, 2020		No	rmal Cost
Active Members			
Occupational Death Benefits		\$	1,826
Occupational Disability Benefits			3,307
Medical and Prescription Drug Benefits			18,649
Medicare Part D Subsidy			(3,487)
Subtotal		\$	20,295
Administrative Expense Load			
Occupational Death & Disability		\$	1
Retiree Medical			20
Subtotal		\$	21
Total		\$	20,316
Total Occupational Death & Disability		\$	5,134
Total Retiree Medical, Net of Part D Subsidy		\$	15,182
Total Retiree Medical, Gross of Part D Subsidy		\$	18,669

Section 1.2: Actuarial Contributions as of June 30, 2020 for FY23 (\$'s in 000's)

Peace Officer / Firefighter

Normal Cost Rate	- 1	Occupational Death & Disability		Retiree Medical	Total	
1. Total Normal Cost	\$	1,380	\$	1,770	\$ 3,150	
2. DCR Plan Rate Payroll Projected for FY21		203,314		203,314	203,314	
3. Employer Normal Cost Rate, (1) ÷ (2)		0.68%		0.87%	1.55%	
Past Service Rate						
Actuarial Accrued Liability	\$	8,018	\$	16,414	\$ 24,432	
2. Valuation Assets		13,243		15,766	 29,009	
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$	(5,225)	\$	648	\$ (4,577)	
4. Funded Ratio based on Valuation Assets		165.2%		96.1%	118.7%	
5. Past Service Cost Amortization Payment		(391)		75	(316)	
6. DCR Plan Rate Payroll Projected for FY21		203,314		203,314	203,314	
7. Past Service Cost Rate, (5) ÷ (6)		(0.19%)		0.04%	(0.15%)	
Total Employer Contribution Rate, not less than Normal Cost Rate		0.68%		0.91%	1.59%	

The table below shows the total employer contribution rate based on total DB and DCR Plan payroll for informational purposes.

Total Employer Contribution Rate as Percent of Total Payroll		cupational Death & Isability	Retiree Medical	Total		
1. Total Normal Cost	\$	1,380	\$ 1,770	\$	3,150	
Total DB and DCR Plan Rate Payroll Projected for FY21		362,869	362,869		362,869	
3. Employer Normal Cost Rate, (1) ÷ (2)		0.38%	0.49%		0.87%	
4. Past Service Cost Amortization Payment		(391)	75		(316)	
5. Past Service Cost Rate, (4) ÷ (2)		(0.11%)	0.02%		(0.09%)	
Total Employer Contribution Rate, not less than Normal Cost Rate		0.38%	0.51%		0.89%	

Peace Officer / Firefighter

Schedule of Past Service Cost Amortizations - Occupational Death & Disability (\$'s in 000's)

	Amortizat	Amortization Period		Ва	lance	S	
Layer	Date Created	Years Remaining		Initial	0	utstanding	ginning-of- ir Payment
Initial Unfunded Liability	06/30/2007	12	\$	(100)	\$	(97)	\$ (10)
FY08 Gain	06/30/2008	13		(586)		(574)	(57)
Change in Assumptions	06/30/2009	14		(104)		(104)	(10)
FY09 Loss	06/30/2009	14		446		445	42
Change in Assumptions	06/30/2010	15		79		79	7
FY10 Gain	06/30/2010	15		(282)		(286)	(25)
FY11 Loss	06/30/2011	16		73		71	6
FY12 Gain	06/30/2012	17		(349)		(359)	(29)
FY13 Gain	06/30/2013	18		(204)		(210)	(17)
Change in Assumptions	06/30/2014	19		(1,274)		(1,313)	(100)
PRPA Modification	06/30/2014	19		(91)		(93)	(7)
FY14 Gain	06/30/2014	19		(95)		(98)	(7)
FY15 Gain	06/30/2015	20		(664)		(682)	(50)
FY16 Loss	06/30/2016	21		4		4	0
FY17 Gain	06/30/2017	22		(525)		(534)	(37)
FY18 Gain	06/30/2018	23		(262)		(264)	(18)
Change in Assumptions	06/30/2018	23		(633)		(638)	(43)
FY19 Loss	06/30/2019	24		219		220	15
FY20 Gain	06/30/2020	25		(792)		(792)	(51)
Total					\$	(5,225)	\$ (391)

Peace Officer / Firefighter

Schedule of Past Service Cost Amortizations - Retiree Medical (\$'s in 000's)

	Amortizat	ion Period	Bal	lances		
Layer	Date Created	Years Remaining	Initial	Ou	tstanding	jinning-of- r Payment
Initial Unfunded Liability	06/30/2007	12	\$ (21)	\$	(23)	\$ (2)
Change in Assumptions	06/30/2008	13	17		16	2
FY08 Gain	06/30/2008	13	(62)		(61)	(6)
Change in Assumptions	06/30/2009	14	(8)		(8)	(1)
FY09 Gain	06/30/2009	14	(38)		(39)	(4)
Change in Assumptions	06/30/2010	15	41		41	4
FY10 Gain	06/30/2010	15	(46)		(43)	(4)
FY11 Loss	06/30/2011	16	70		69	6
Change in Assumptions	06/30/2012	17	3,085		3,166	259
FY12 Gain	06/30/2012	17	(273)		(279)	(23)
FY13 Loss	06/30/2013	18	880		906	71
Change in Assumptions	06/30/2014	19	(3,034)		(3,125)	(238)
FY14 Loss	06/30/2014	19	1,213		1,250	95
FY15 Gain	06/30/2015	20	(712)		(731)	(54)
EGWP Gain	06/30/2016	21	(1,675)		(1,715)	(122)
FY16 Loss	06/30/2016	21	1,116		1,144	82
Change in Assumptions	06/30/2017	22	2,244		2,281	158
FY17 Gain	06/30/2017	22	(50)		(52)	(4)
FY18 Gain	06/30/2018	23	(231)		(233)	(16)
Change in Assumptions/Methods	06/30/2018	23	(649)		(653)	(44)
FY19 Gain	06/30/2019	24	(1,291)		(1,297)	(86)
Change in Assumptions	06/30/2020	25	1,116		1,116	72
FY20 Gain	06/30/2020	25	(1,082)		(1,082)	(70)
Total				\$	648	\$ 75

Peace Officer / Firefighter

Schedule of Past Service Cost Amortizations - Total (\$'s in 000's)

	Amortizat	ion Period	Bal	lances			
Layer	Date Created	Years Remaining	Initial	Ou	tstanding	Beç Yea	jinning-of- r Payment
Initial Unfunded Liability	06/30/2007	12	\$ (121)	\$	(120)	\$	(12)
Change in Assumptions	06/30/2008	13	17		16		2
FY08 Gain	06/30/2008	13	(648)		(635)		(63)
Change in Assumptions	06/30/2009	14	(112)		(112)		(11)
FY09 Loss	06/30/2009	14	408		406		38
Change in Assumptions	06/30/2010	15	120		120		11
FY10 Gain	06/30/2010	15	(328)		(329)		(29)
FY11 Loss	06/30/2011	16	143		140		12
Change in Assumptions	06/30/2012	17	3,085		3,166		259
FY12 Gain	06/30/2012	17	(622)		(638)		(52)
FY13 Loss	06/30/2013	18	676		696		54
Change in Assumptions	06/30/2014	19	(4,308)		(4,438)		(338)
PRPA Modification	06/30/2014	19	(91)		(93)		(7)
FY14 Loss	06/30/2014	19	1,118		1,152		88
FY15 Gain	06/30/2015	20	(1,376)		(1,413)		(104)
EGWP Gain	06/30/2016	21	(1,675)		(1,715)		(122)
FY16 Loss	06/30/2016	21	1,120		1,148		82
Change in Assumptions	06/30/2017	22	2,244		2,281		158
FY17 Gain	06/30/2017	22	(575)		(586)		(41)
FY18 Gain	06/30/2018	23	(493)		(497)		(34)
Change in Assumptions/Methods	06/30/2018	23	(1,282)		(1,291)		(87)
FY19 Gain	06/30/2019	24	(1,072)		(1,077)		(71)
Change in Assumptions	06/30/2020	25	1,116		1,116		72
FY20 Gain	06/30/2020	25	(1,874)		(1,874)		(121)
Total				\$	(4,577)	\$	(316)

Section 1.2: Actuarial Contributions as of June 30, 2020 for FY23 (\$'s in 000's)

Others

Name of Coat Bata	ccupational Death &	Retiree Medical	Total
Normal Cost Rate	Disability	Medical	Total
Total Normal Cost	\$ 3,754	\$ 13,412	\$ 17,166
2. DCR Plan Rate Payroll Projected for FY21	1,239,703	1,239,703	1,239,703
3. Employer Normal Cost Rate, (1) ÷ (2)	0.30%	1.08%	1.38%
Past Service Rate			
1. Actuarial Accrued Liability	\$ 2,616	\$ 134,287	\$ 136,903
2. Valuation Assets	29,786	128,981	158,767
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$ (27,170)	\$ 5,306	\$ (21,864)
4. Funded Ratio based on Valuation Assets	1,138.6%	96.0%	116.0%
5. Past Service Cost Amortization Payment	(1,994)	675	(1,319)
6. DCR Plan Rate Payroll Projected for FY21	1,239,703	1,239,703	1,239,703
7. Past Service Cost Rate, (5) ÷ (6)	(0.16%)	0.05%	(0.11%)
Total Employer Contribution Rate, not less than Normal Cost Rate	0.30%	1.13%	1.43%

The table below shows the total employer contribution rate based on total DB and DCR Plan payroll for informational purposes.

Total Employer Contribution Rate as Percent of Total Payroll		pational ath & ability	Retiree Medical	Total		
1. Total Normal Cost	\$	3,754	\$ 13,412	\$	17,166	
Total DB and DCR Plan Rate Payroll Projected for FY21	2	2,010,209	2,010,209		2,010,209	
3. Employer Normal Cost Rate, (1) ÷ (2)		0.19%	0.66%		0.85%	
4. Past Service Cost Amortization Payment		(1,994)	675		(1,319)	
5. Past Service Cost Rate, (4) ÷ (2)		(0.10%)	0.03%		(0.07%)	
Total Employer Contribution Rate, not less than Normal Cost Rate		0.19%	0.69%		0.88%	

Others

Schedule of Past Service Cost Amortizations - Occupational Death & Disability (\$'s in 000's)

	Amortization Period		Bal	lance	es	
Layer	Date Created	Years Remaining	Initial	C	utstanding	ginning-of- ar Payment
Initial Unfunded Liability	06/30/2007	12	\$ (40)	\$	(39)	\$ (4)
FY08 Gain	06/30/2008	13	(318)		(313)	(31)
Change in Assumptions	06/30/2009	14	(92)		(91)	(8)
FY09 Gain	06/30/2009	14	(1,924)		(1,917)	(180)
Change in Assumptions	06/30/2010	15	24		25	2
FY10 Gain	06/30/2010	15	(994)		(1,004)	(90)
FY11 Gain	06/30/2011	16	(1,184)		(1,204)	(103)
FY12 Gain	06/30/2012	17	(1,233)		(1,264)	(104)
FY13 Gain	06/30/2013	18	(779)		(802)	(63)
Change in Assumptions	06/30/2014	19	(51)		(52)	(4)
PRPA Modification	06/30/2014	19	(27)		(28)	(2)
FY14 Gain	06/30/2014	19	(2,003)		(2,061)	(157)
FY15 Gain	06/30/2015	20	(1,850)		(1,900)	(140)
FY16 Gain	06/30/2016	21	(2,361)		(2,416)	(172)
FY17 Gain	06/30/2017	22	(2,377)		(2,415)	(168)
FY18 Gain	06/30/2018	23	(2,590)		(2,609)	(176)
Change in Assumptions	06/30/2018	23	(272)		(275)	(19)
FY19 Gain	06/30/2019	24	(3,984)		(4,002)	(265)
FY20 Gain	06/30/2020	25	(4,803)		(4,803)	(310)
Total				\$	(27,170)	\$ (1,994)

Others

Schedule of Past Service Cost Amortizations - Retiree Medical (\$'s in 000's)

	Amortizat	ion Period	Bal	ances	
Layer	Date Created	Years Remaining	Initial	Outstanding	jinning-of- r Payment
Initial Unfunded Liability	06/30/2007	12	\$ (335)	\$ (321)	\$ (34)
Change in Assumptions	06/30/2008	13	165	162	16
FY08 Gain	06/30/2008	13	(702)	(686)	(68)
Change in Assumptions	06/30/2009	14	(122)	(121)	(11)
FY09 Gain	06/30/2009	14	(438)	(436)	(40)
Change in Assumptions	06/30/2010	15	(572)	(577)	(52)
FY10 Loss	06/30/2010	15	579	580	52
FY11 Loss	06/30/2011	16	820	838	71
Change in Assumptions	06/30/2012	17	25,180	25,838	2,113
FY12 Loss	06/30/2012	17	1,451	1,487	122
FY13 Loss	06/30/2013	18	9,974	10,270	809
Change in Assumptions	06/30/2014	19	(21,822)	(22,478)	(1,708)
FY14 Loss	06/30/2014	19	7,002	7,213	548
FY15 Gain	06/30/2015	20	(8,726)	(8,970)	(660)
EGWP Gain	06/30/2016	21	(17,884)	(18,293)	(1,307)
FY16 Loss	06/30/2016	21	10,367	10,603	757
Change in Assumptions	06/30/2017	22	21,288	21,631	1,503
FY17 Gain	06/30/2017	22	(1,658)	(1,684)	(117)
FY18 Loss	06/30/2018	23	118	119	8
Change in Assumptions/Methods	06/30/2018	23	(8,993)	(9,060)	(613)
FY19 Gain	06/30/2019	24	(10,841)	(10,890)	(719)
Change in Assumptions	06/30/2020	25	6,369	6,369	411
FY20 Gain	06/30/2020	25	(6,288)	(6,288)	(406)
Total				\$ 5,306	\$ 675

Others

Schedule of Past Service Cost Amortizations - Total (\$'s in 000's)

	Amortization Period		Bal			
Layer	Date Created	Years Remaining	Initial	0	utstanding	ginning-of- ar Payment
Initial Unfunded Liability	06/30/2007	12	\$ (375)	\$	(360)	\$ (38)
Change in Assumptions	06/30/2008	13	165		162	16
FY08 Gain	06/30/2008	13	(1,020)		(999)	(99)
Change in Assumptions	06/30/2009	14	(214)		(212)	(19)
FY09 Gain	06/30/2009	14	(2,362)		(2,353)	(220)
Change in Assumptions	06/30/2010	15	(548)		(552)	(50)
FY10 Gain	06/30/2010	15	(415)		(424)	(38)
FY11 Gain	06/30/2011	16	(364)		(366)	(32)
Change in Assumptions	06/30/2012	17	25,180		25,838	2,113
FY12 Loss	06/30/2012	17	218		223	18
FY13 Loss	06/30/2013	18	9,195		9,468	746
Change in Assumptions	06/30/2014	19	(21,873)		(22,530)	(1,712)
PRPA Modification	06/30/2014	19	(27)		(28)	(2)
FY14 Loss	06/30/2014	19	4,999		5,152	391
FY15 Gain	06/30/2015	20	(10,576)		(10,870)	(800)
EGWP Gain	06/30/2016	21	(17,884)		(18,293)	(1,307)
FY16 Loss	06/30/2016	21	8,006		8,187	585
Change in Assumptions	06/30/2017	22	21,288		21,631	1,503
FY17 Gain	06/30/2017	22	(4,035)		(4,099)	(285)
FY18 Gain	06/30/2018	23	(2,472)		(2,490)	(168)
Change in Assumptions/Methods	06/30/2018	23	(9,265)		(9,335)	(632)
FY19 Gain	06/30/2019	24	(14,825)		(14,892)	(984)
Change in Assumptions	06/30/2020	25	6,369		6,369	411
FY20 Gain	06/30/2020	25	(11,091)		(11,091)	(716)
Total				\$	(21,864)	\$ (1,319)

Section 1.2: Actuarial Contributions as of June 30, 2020 for FY23 (\$'s in 000's)

All Members

Normal Cost Rate		ccupational Death & Disability	Retiree Medical	Total		
1. Total Normal Cost	\$	5,134	\$ 15,182	\$	20,316	
2. DCR Plan Rate Payroll Projected for FY21		1,443,017	1,443,017		1,443,017	
3. Employer Normal Cost Rate, (1) ÷ (2)		0.36%	1.05%		1.41%	
Past Service Rate						
Actuarial Accrued Liability	\$	10,634	\$ 150,701	\$	161,335	
2. Valuation Assets		43,029	 144,747		187,776	
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$	(32,395)	\$ 5,954	\$	(26,441)	
4. Funded Ratio based on Valuation Assets		404.6%	96.0%		116.4%	
5. Past Service Cost Amortization Payment		(2,385)	750		(1,635)	
6. DCR Plan Rate Payroll Projected for FY21		1,443,017	1,443,017		1,443,017	
7. Past Service Cost Rate, (5) ÷ (6)		(0.17%)	0.05%		(0.12%)	
Total Employer Contribution Rate, not less than Normal Cost Rate		0.36%	1.10%		1.46%	

The table below shows the total employer contribution rate based on total DB and DCR Plan payroll for informational purposes.

Total Employer Contribution Rate as Percent of Total Payroll		cupational Death & Iisability	Retiree Medical	Total		
1. Total Normal Cost	\$	5,134	\$ 15,182	\$	20,316	
Total DB and DCR Plan Rate Payroll Projected for FY21		2,373,078	2,373,078		2,373,078	
3. Employer Normal Cost Rate, (1) ÷ (2)		0.22%	0.64%		0.86%	
4. Past Service Cost Amortization Payment		(2,385)	750		(1,635)	
5. Past Service Cost Rate, (4) ÷ (2)		(0.10%)	0.03%		(0.07%)	
Total Employer Contribution Rate, not less than Normal Cost Rate		0.22%	0.67%		0.89%	

All Members

Schedule of Past Service Cost Amortizations - Occupational Death & Disability (\$'s in 000's)

	Amortizat	Amortization Period		Bal	s		
Layer	Date Created	Years Remaining		Initial	0	utstanding	ginning-of- ar Payment
Initial Unfunded Liability	06/30/2007	12	\$	(140)	\$	(136)	\$ (14)
FY08 Gain	06/30/2008	13		(904)		(887)	(88)
Change in Assumptions	06/30/2009	14		(196)		(195)	(18)
FY09 Gain	06/30/2009	14		(1,478)		(1,472)	(138)
Change in Assumptions	06/30/2010	15		103		104	9
FY10 Gain	06/30/2010	15		(1,276)		(1,290)	(115)
FY11 Gain	06/30/2011	16		(1,111)		(1,133)	(97)
FY12 Gain	06/30/2012	17		(1,582)		(1,623)	(133)
FY13 Gain	06/30/2013	18		(983)		(1,012)	(80)
Change in Assumptions	06/30/2014	19		(1,325)		(1,365)	(104)
PRPA Modification	06/30/2014	19		(118)		(121)	(9)
FY14 Gain	06/30/2014	19		(2,098)		(2,159)	(164)
FY15 Gain	06/30/2015	20		(2,514)		(2,582)	(190)
FY16 Gain	06/30/2016	21		(2,357)		(2,412)	(172)
FY17 Gain	06/30/2017	22		(2,902)		(2,949)	(205)
FY18 Gain	06/30/2018	23		(2,852)		(2,873)	(194)
Change in Assumptions	06/30/2018	23		(905)		(913)	(62)
FY19 Gain	06/30/2019	24		(3,765)		(3,782)	(250)
FY20 Gain	06/30/2020	25		(5,595)		(5,595)	(361)
Total					\$	(32,395)	\$ (2,385)

All Members

Schedule of Past Service Cost Amortizations - Retiree Medical (\$'s in 000's)

	Amortizat	ion Period	Bal	ances	
Layer	Date Created	Years Remaining	Initial	Outstanding	inning-of- r Payment
Initial Unfunded Liability	06/30/2007	12	\$ (356)	\$ (344)	\$ (36)
Change in Assumptions	06/30/2008	13	182	178	18
FY08 Gain	06/30/2008	13	(764)	(747)	(74)
Change in Assumptions	06/30/2009	14	(130)	(129)	(12)
FY09 Gain	06/30/2009	14	(476)	(475)	(44)
Change in Assumptions	06/30/2010	15	(531)	(536)	(48)
FY10 Loss	06/30/2010	15	533	537	48
FY11 Loss	06/30/2011	16	890	907	77
Change in Assumptions	06/30/2012	17	28,265	29,004	2,372
FY12 Loss	06/30/2012	17	1,178	1,208	99
FY13 Loss	06/30/2013	18	10,854	11,176	880
Change in Assumptions	06/30/2014	19	(24,856)	(25,603)	(1,946)
FY14 Loss	06/30/2014	19	8,215	8,463	643
FY15 Gain	06/30/2015	20	(9,438)	(9,701)	(714)
EGWP Gain	06/30/2016	21	(19,559)	(20,008)	(1,429)
FY16 Loss	06/30/2016	21	11,483	11,747	839
Change in Assumptions	06/30/2017	22	23,532	23,912	1,661
FY17 Gain	06/30/2017	22	(1,708)	(1,736)	(121)
FY18 Gain	06/30/2018	23	(113)	(114)	(8)
Change in Assumptions/Methods	06/30/2018	23	(9,642)	(9,713)	(657)
FY19 Gain	06/30/2019	24	(12,132)	(12,187)	(805)
Change in Assumptions	06/30/2020	25	7,485	7,485	483
FY20 Gain	06/30/2020	25	(7,370)	(7,370)	(476)
Total				\$ 5,954	\$ 750

All Members

Schedule of Past Service Cost Amortizations - Total (\$'s in 000's)

	Amortizat	ion Period	Balances			es		
- Layer	Date Created	Years Remaining		Initial	C	Outstanding		eginning-of- ear Payment
Initial Unfunded Liability	06/30/2007	12	\$	(496)	\$	(480)	\$	(50)
Change in Assumptions	06/30/2008	13		182		178		18
FY08 Gain	06/30/2008	13		(1,668)		(1,634)		(162)
Change in Assumptions	06/30/2009	14		(326)		(324)		(30)
FY09 Gain	06/30/2009	14		(1,954)		(1,947)		(182)
Change in Assumptions	06/30/2010	15		(428)		(432)		(39)
FY10 Gain	06/30/2010	15		(743)		(753)		(67)
FY11 Gain	06/30/2011	16		(221)		(226)		(20)
Change in Assumptions	06/30/2012	17		28,265		29,004		2,372
FY12 Gain	06/30/2012	17		(404)		(415)		(34)
FY13 Loss	06/30/2013	18		9,871		10,164		800
Change in Assumptions	06/30/2014	19		(26,181)		(26,968)		(2,050)
PRPA Modification	06/30/2014	19		(118)		(121)		(9)
FY14 Loss	06/30/2014	19		6,117		6,304		479
FY15 Gain	06/30/2015	20		(11,952)		(12,283)		(904)
EGWP Gain	06/30/2016	21		(19,559)		(20,008)		(1,429)
FY16 Loss	06/30/2016	21		9,126		9,335		667
Change in Assumptions	06/30/2017	22		23,532		23,912		1,661
FY17 Gain	06/30/2017	22		(4,610)		(4,685)		(326)
FY18 Gain	06/30/2018	23		(2,965)		(2,987)		(202)
Change in Assumptions/Methods	06/30/2018	23		(10,547)		(10,626)		(719)
FY19 Gain	06/30/2019	24		(15,897)		(15,969)		(1,055)
Change in Assumptions	06/30/2020	25		7,485		7,485		483
FY20 Gain	06/30/2020	25		(12,965)		(12,965)		(837)
Total					\$	(26,441)	\$	(1,635)

Section 1.3: Actuarial Gain/(Loss) for FY20 (\$'s in 000's)

	D	upational leath & isability	Retiree Medical	Total	
1. Expected Actuarial Accrued Liability					
a. Actuarial Accrued Liability as of June 30, 2019	\$	9,774	\$ 124,946	\$	134,720
b. Normal Cost		4,808	13,747		18,555
c. Interest on (a) and (b) at 7.38%		1,076	10,236		11,312
d. Employer Group Waiver Plan		0	34		34
e. Benefit Payments		(479)	(69)		(548)
f. Interest on (d) and (e) at 7.38%, adjusted for timing		(19)	(1)		(20)
g. Assumption/Method Changes		0	 7,485		7,485
h. Expected Actuarial Accrued Liability as of June 30, 2020 (a) + (b) + (c) + (d) + (e) + (f) + (g)	\$	15,160	\$ 156,378	\$	171,538
2. Actual Actuarial Accrued Liability as of June 30, 2020		10,634	 150,701		161,335
3. Liability Gain/(Loss), (1)(h) - (2)	\$	4,526	\$ 5,677	\$	10,203
4. Expected Actuarial Asset Value					
a. Actuarial Asset Value as of June 30, 2019	\$	36,701	\$ 118,783	\$	155,484
b. Interest on (a) at 7.38%		2,709	8,766		11,475
c. Employer Contributions		4,387	17,846		22,233
d. Employer Group Waiver Plan		0	34		34
e. Interest on (c) and (d) at 7.38%, adjusted for timing		159	648		807
f. Benefit Payments		(479)	(69)		(548)
g. Administrative Expenses		0	(26)		(26)
h. Interest on (f) and (g) at 7.38%, adjusted for timing		(19)	 (3)		(22)
i. Expected Actuarial Asset Value as of June 30, 2020(a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	\$	43,458	\$ 145,979	\$	189,437
5. Actuarial Asset Value as of June 30, 2020		43,029	 144,747		187,776
6. Actuarial Asset Gain/(Loss), (5) - (4)(i)	\$	(429)	\$ (1,232)	\$	(1,661)
7. Total Actuarial Gain/(Loss), (3) + (6)	\$	4,097	\$ 4,445	\$	8,542
8. Contribution Gain/(Loss)	\$	1,497	\$ 2,943	\$	4,440
9. Administrative Expense Gain/(Loss)	\$	1	\$ (18)	\$	(17)
10. FY20 Gain/(Loss), (7) + (8) + (9)	\$	5,595	\$ 7,370	\$	12,965

Section 1.4: History of Unfunded Liability and Funded Ratio (\$'s in 000's)

Valuation Date	Total Actuarial Accrued Liabilit		Assets as a Percent of Actuarial ets Accrued Liabili	Unfunded Actuarial Accrued Liability ty (UAAL)
June 30, 2007	\$ 759	\$ 1,255	165.3%	\$ (496)
June 30, 2008	2,018	4,007	198.6%	(1,989)
June 30, 2009	4,316	8,613	199.6%	(4,297)
June 30, 2010	8,038	13,568	168.8%	(5,530)
June 30, 2011	13,251	19,058	143.8%	(5,807)
June 30, 2012	46,921	24,915	53.1%	22,006
June 30, 2013	63,885	31,709	49.6%	32,176
June 30, 2014	53,844	41,461	77.0%	12,383
June 30, 2015	63,732	63,202	99.2%	530
June 30, 2016	77,052	87,027	112.9%	(9,975)
June 30, 2017	117,243	108,503	92.5%	8,740
June 30, 2018	126,311	131,058	103.8%	(4,747)
June 30, 2019	134,720	155,484	115.4%	(20,764)
June 30, 2020	161,335	187,776	116.4%	(26,441)

Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets (\$'s in 000's)

	0	upational Death &	Retiree		Allocation
As of June 30, 2020	D	isability	Medical	Total	Percent
Cash and Short-Term Investments					
- Cash and Cash Equivalents	\$	534	\$ 1,868	\$ 2,402	1.3%
- Subtotal	\$	534	\$ 1,868	\$ 2,402	1.3%
Fixed Income Investments					
- Domestic Fixed Income Pool	\$	9,050	\$ 30,391	\$ 39,441	21.6%
- International Fixed Income Pool		0	0	0	0.0%
- Tactical Fixed Income Pool		0	0	0	0.0%
- High Yield Pool		0	0	0	0.0%
- Treasury Inflation Protection Pool		0	0	0	0.0%
- Emerging Debt Pool		0	 0	 0	0.0%
- Subtotal	\$	9,050	\$ 30,391	\$ 39,441	21.6%
Equity Investments					
- Domestic Equity Pool	\$	11,402	\$ 38,291	\$ 49,693	27.2%
- International Equity Pool		6,506	21,849	28,355	15.5%
- Private Equity Pool		5,159	17,326	22,485	12.3%
- Emerging Markets Equity Pool		1,361	4,569	5,930	3.3%
- Alternative Equity Strategies		2,269	 7,622	 9,891	5.4%
- Subtotal	\$	26,697	\$ 89,657	\$ 116,354	63.7%
Other Investments					
- Real Estate Pool	\$	2,573	\$ 8,642	\$ 11,215	6.1%
- Other Investments Pool		3,074	10,324	13,398	7.3%
- Absolute Return Pool		0	0	0	0.0%
- Other Assets		0	 0	 0	0.0%
- Subtotal	\$	5,647	\$ 18,966	\$ 24,613	13.4%
Total Cash and Investments	\$	41,928	\$ 140,882	\$ 182,810	100.0%
Net Accrued Receivables		163	687	 850	
Net Assets	\$	42,091	\$ 141,569	\$ 183,660	
Peace Officer / Firefighter	\$	12,954	N/A	N/A	
Others		29,137	 N/A	 N/A	
All Members	\$	42,091	\$ 141,569	\$ 183,660	

Section 2.2: Changes in Fair Value of Assets During FY20 (\$'s in 000's)

Fiscal Year 2020		D	upational leath & isability	Retiree Medical	Total		
1. Fair Value of Asse	ets as of June 30, 2019	\$	36,525	\$ 118,238	\$	154,763	
2. Additions:							
a. Member Conti	ributions	\$	0	\$ 0	\$	0	
b. Employer Con	tributions		4,387	17,846		22,233	
c. Interest and D	ividend Income		591	1,944		2,535	
d. Net Appreciati Fair Value of I	on/(Depreciation) in nvestments		1,176	3,961		5,137	
e. Employer Gro	up Waiver Plan		0	34		34	
f. Other			0	0		0	
g. Total Addition	s	\$	6,154	\$ 23,785	\$	29,939	
3. Deductions:							
a. Medical Benef	fits	\$	0	\$ 69	\$	69	
b. Death & Disab	oility Benefits		479	0		479	
c. Investment Ex	penses		109	359		468	
d. Administrative	Expenses		0	 26		26	
e. Total Deductio	ons	\$	588	\$ 454	\$	1,042	
4. Fair Value of Asse	ets as of June 30, 2020	\$	42,091	\$ 141,569	\$	183,660	
	Value Investment Return Rate f Investment Expenses		4.3%	4.4%		4.3%	

Section 2.3: Development of Actuarial Value of Assets (\$'s in 000's)

The actuarial value of assets and the fair value were \$0 at June 30, 2006. Investment gains and losses are recognized 20% per year over 5 years. In no event may valuation assets be less than 80% or more than 120% of fair value as of the current valuation date.

	cupational Death & Disability	Retiree Medical	Total
1. Investment Gain/(Loss) for FY20			
a. Fair Value as of June 30, 2019	\$ 36,525	\$ 118,238	\$ 154,763
b. Contributions	4,387	17,846	22,233
c. Employer Group Waiver Plan	0	34	34
d. Benefit Payments	479	69	548
e. Administrative Expenses	0	26	26
f. Actual Investment Return (net of investment expenses)	1,658	5,546	7,204
g. Expected Return Rate (net of investment expenses)	7.38%	7.38%	7.38%
h. Expected Return	2,836	9,371	12,207
i. Investment Gain/(Loss) for the Year (f) - (h)	(1,178)	(3,825)	(5,003)
2. Actuarial Value as of June 30, 2020			
a. Fair Value as of June 30, 2020	\$ 42,091	\$ 141,569	\$ 183,660
b. Deferred Investment Gain/(Loss)	(938)	(3,178)	(4,116)
c. Preliminary Actuarial Value as of June 30, 2020, (a) - (b)	43,029	144,747	187,776
d. Upper Limit: 120% of Fair Value as of June 30, 2020	50,509	169,882	220,391
e. Lower Limit: 80% of Fair Value as of June 30, 2020	33,673	113,256	146,929
f. Actuarial Value at June 30, 2020, (c) limited by (d) and (e)	43,029	144,747	187,776
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	102.2%	102.2%	102.2%
Approximate Actuarial Value Investment Return Rate during FY20 Net of Investment Expenses	6.3%	6.4%	6.4%
5. Actuarial Value Allocation ¹			
a. Peace Officer / Firefighter	\$ 13,243	\$ 15,766	\$ 29,009
b. Others	29,786	 128,981	 158,767
c. All Members	\$ 43,029	\$ 144,747	\$ 187,776

¹ Occupational death & disability allocated using fair value of assets. Retiree medical allocated based on retiree medical actuarial accrued liability.

The tables below show the development of the gains/(losses) to be recognized in the current year (\$'s in 000's):

Occupational Death & Disability												
Fiscal Year Ending		Asset Gain / (Loss)		Gain / (Loss) Recognized in Prior Years		/ (Loss) ognized s Year	Defe	/ (Loss) erred to re Years				
June 30, 2016	\$	(1,649)	\$	(1,320)	\$	(329)	\$	0				
June 30, 2017		1,090		654		218		218				
June 30, 2018		23		10		5		8				
June 30, 2019		(370)		(74)		(74)		(222)				
June 30, 2020		(1,178)		0		(236)		(942)				
Total	\$	(2,084)	\$	(730)	\$	(416)	\$	(938)				

Retiree Medical											
Fiscal Year Ending	Asset Gain / (Loss)				Rec	n / (Loss) cognized ior Years	Rec	ı / (Loss) ognized is Year	Def	n / (Loss) erred to ure Years	
June 30, 2016	\$ (4,	028)	\$	(3,224)	\$	(804)	\$	0			
June 30, 2017	3,	156		1,893		631		632			
June 30, 2018		(58)		(24)		(12)		(22)			
June 30, 2019	(1,	212)		(242)		(242)		(728)			
June 30, 2020	(3,	825)		0		(765)		(3,060)			
Total	\$ (5,	967)	\$	(1,597)	\$	(1,192)	\$	(3,178)			

Total									
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years					
June 30, 2016	\$ (5,677)	\$ (4,544)	\$ (1,133)	\$ 0					
June 30, 2017	4,246	2,547	849	850					
June 30, 2018	(35)	(14)	(7)	(14)					
June 30, 2019	(1,582)	(316)	(316)	(950)					
June 30, 2020	(5,003)	0	(1,001)	(4,002)					
Total	\$ (8,051)	\$ (2,327)	\$ (1,608)	\$ (4,116)					

Section 2.4: Historical Asset Rates of Return

	Actual	rial Value	Fair	· Value
Year Ending	Annual	Cumulative*	Annual	Cumulative*
June 30, 2008	5.0%	5.0%	(7.1%)	(7.1%)
June 30, 2009	2.4%	3.7%	(13.0%)	(10.1%)
June 30, 2010	3.9%	3.8%	6.6%	(4.8%)
June 30, 2011	7.3%	4.6%	19.2%	0.7%
June 30, 2012	6.9%	5.1%	2.0%	0.9%
June 30, 2013	7.9%	5.5%	11.8%	2.7%
June 30, 2014	10.9%	6.3%	18.0%	4.7%
June 30, 2015	9.5%	6.7%	3.3%	4.6%
June 30, 2016	6.7%	6.7%	0.2%	4.1%
June 30, 2017	7.8%	6.8%	12.6%	4.9%
June 30, 2018	7.9%	6.9%	7.9%	5.2%
June 30, 2019	6.6%	6.9%	6.2%	5.2%
June 30, 2020	6.4%	6.8%	4.3%	5.2%

^{*} Cumulative since fiscal year ending June 30, 2008

Section 3: Member Data

Section 3.1: Summary of Members Included

As of June 30		2016		2017		2018	2019	2020
Active Members - Peace Officer / Fire	fight							1
1. Number		1,605		1,701		1,905	2,038	2,228 ¹
2. Average Age		35.17		35.59		35.63	35.76	35.92
Average Credited Service		4.12		4.65		4.83	5.09	5.36
Average Entry Age		31.05		30.94		30.80	30.67	30.56
5. Average Annual Earnings	\$	76,213	\$	77,800	\$	78,603	\$ 84,593	\$ 87,365
Active Members - Others								
1. Number		16,610		17,470		18,473	19,864	20,695 ²
2. Average Age		40.90		41.22		41.34	41.49	41.78
3. Average Credited Service		3.51		3.83		4.08	4.25	4.59
4. Average Entry Age		37.39		37.39		37.26	37.24	37.19
5. Average Annual Earnings	\$	55,335	\$	56,100	\$	57,349	\$ 58,223	\$ 59,603
Active Members - Total								
1. Number		18,215		19,171		20,378	21,902	22,923 ³
2. Average Age		40.39		40.72		40.80	40.96	41.21
3. Average Credited Service		3.56		3.90		4.15	4.33	4.66
4. Average Entry Age		36.83		36.82		36.65	36.63	36.55
5. Average Annual Earnings	\$	57,175	\$	58,025	\$	59,336	\$ 60,676	\$ 62,302
Disabilitants and Beneficiaries (Occu	patio	onal Deatl	h & Di	sability)				
1. Number		12		14		15	16	15
2. Average Age		44.19		42.37		43.66	42.28	44.66
Average Monthly Death & Disability Benefit	\$	2,442	\$	2,199	\$	2,285	\$ 2,404	\$ 2,698
Retirees, Surviving Spouses, and Dep	end	ent Spou	ses (F	Retiree M	edical			
1. Number		0		9		23	43	66
2. Average Age		N/A		70.76		69.97	69.72	68.85
Total Number of Members		18,227		19,194		20,416	21,961	23,004

Average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

¹ Includes 1,851 male active members and 377 female active members.

² Includes 8,840 male active members and 11,855 female active members.

³ Includes 10,691 male active members and 12,232 female active members.

Section 3.2: Age and Service Distribution of Active Members

Annual Earnings by Age

Total Average Annual **Annual** Number Age **Earnings Earnings** 0 - 19 91 3,621,900 \$ 39,801 20 - 24 1,197 56,027,881 46,807 25 - 29 3,079 174,465,728 56,663 30 - 34 3,905 245,016,855 62,744 35 - 39 3,639 241,473,524 66,357 40 - 44 2,865 190,250,153 66,405 45 - 49 2,442 154,441,003 63,244 50 - 54 2,061 129,385,144 62,778 55 - 59 1,852 118,234,931 63,842 60 - 64 1,250 80,198,279 64,159 65 - 69 410 27,487,967 67,044 70 - 74 104 6,117,074 58,818 75+ 28 1,419,946 50,712

Total 22,923 \$1,428,140,385 \$ 62,302

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	3,822	\$ 184,241,494	\$ 48,206
1	3,499	186,233,418	53,225
2	2,666	151,093,642	56,674
3	2,021	123,050,379	60,886
4	1,774	112,245,646	63,273
0 - 4	13,782	\$ 756,864,579	\$ 54,917
5 - 9	6,598	465,544,939	70,558
10 - 14	2,540	205,456,631	80,888
15 - 19	3	274,236	91,412
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	0	0	0
35 - 39	0	0	0
40+	0	0	0

Total 22,923 \$1,428,140,385 \$ 62,302

Years of Credited Service by Age

	Years of Service									
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
0 - 19	91	0	0	0	0	0	0	0	0	91
20 - 24	1,187	10	0	0	0	0	0	0	0	1,197
25 - 29	2,638	436	5	0	0	0	0	0	0	3,079
30 - 34	2,494	1,202	209	0	0	0	0	0	0	3,905
35 - 39	1,937	1,189	513	0	0	0	0	0	0	3,639
40 - 44	1,513	886	465	1	0	0	0	0	0	2,865
45 - 49	1,292	787	362	1	0	0	0	0	0	2,442
50 - 54	1,016	735	310	0	0	0	0	0	0	2,061
55 - 59	842	672	338	0	0	0	0	0	0	1,852
60 - 64	560	460	229	1	0	0	0	0	0	1,250
65 - 69	149	175	86	0	0	0	0	0	0	410
70 - 74	49	33	22	0	0	0	0	0	0	104
75+	14	13	1	0	0	0	0	0	0	28
Total	13,782	6,598	2,540	3	0	0	0	0	0	22,923

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 3.3: Member Data Reconciliation

	Actives	Retirees and Surviving Spouses	Dependent Spouses	OD&D Disabilitants	OD&D Beneficiaries	Total
As of June 30, 2019 ¹	21,902	34	9	12	4	21,961
New Entrants	3,599	0	0	0	0	3,599
Rehires	618	0	0	0	0	618
Vested Terminations	(557)	0	0	0	0	(557)
Non-Vested Terminations	(1,968)	0	0	0	0	(1,968)
Refund of Contributions	(609)	0	0	0	0	(609)
Disability Retirements	(1)	0	0	1	0	0
Age Retirements	(17)	17	6	0	0	6
Deaths With Beneficiary	0	0	0	0	0	0
Deaths Without Beneficiary	(22)	(4)	0	0	0	(26)
Converted To/From DB Plan	0	0	0	0	0	0
Added Dependent Coverage	0	0	1	0	0	1
Dropped Dependent Coverage	0	0	0	0	0	0
Transfers In/Out	(19)	3	0	0	0	(16)
Data Corrections	(3)	0	0	0	(2)	(5)
Net Change	1,021	16	7	1	(2)	1,043
As of June 30, 2020 ²	22,923	50	16	13	2	23,004

^{1 101} participants are expected to receive retiree medical benefits in a different plan and are included for OD&D benefits only.

² 114 participants are expected to receive retiree medical benefits in a different plan and are included for OD&D benefits only.

Section 3.4: Schedule of Active Member Data

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase in Average Earnings	Number of Participating Employers
June 30, 2020	22,923	\$ 1,428,140	\$ 62,302	2.7%	153
June 30, 2019	21,902	1,328,934	60,676	2.3%	155
June 30, 2018	20,378	1,209,152	59,336	2.3%	155
June 30, 2017	19,171	1,112,398	58,025	1.5%	157
June 30, 2016	18,215	1,041,437	57,175	3.4%	157
June 30, 2015	17,098	945,496	55,299	1.9%	159
June 30, 2014	15,800	857,150	54,250	3.7%	159
June 30, 2013	14,316	748,658	52,295	4.7%	159
June 30, 2012	12,597	629,128	49,943	4.5%	160
June 30, 2011	10,965	524,088	47,796	4.8%	160

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 3.5: Active Member Payroll Reconciliation

Payroll Field	Payroll Data (000's)
a) DRB actual reported salaries FY20 in employer list	\$ 1,320,368
b) DRB actual reported salaries FY20 in valuation data	1,275,698
c) Annualized valuation data	1,428,140
d) Valuation payroll as of June 30, 2020	1,500,403
e) Rate payroll for FY21	1,443,017

- a) Actual reported salaries from DRB employer listing showing all payroll paid during FY20, including those who were not active as of June 30, 2020
- b) Payroll from valuation data for people who are in active status as of June 30, 2020
- c) Payroll from (b) annualized for both new entrants and part-timers
- d) Payroll from (c) with one year of salary scale applied to estimate salaries payable for the upcoming year
- e) Payroll from (d) with the part-timer annualization removed

Section 4: Basis of the Actuarial Valuation

Section 4.1: Summary of Plan Provisions

Effective Date

July 1, 2006, with amendments through June 30, 2020.

Administration of Plan

The Commissioner of Administration or the Commissioner's designee is the administrator of the Plan. The Attorney General of the state is the legal counsel for the Plan and shall advise the administrator and represent the Plan in legal proceedings.

The Alaska Retirement Management Board prescribes policies, adopts regulations, invests the funds, and performs other activities necessary to carry out the provisions of the Plan.

Employers Included

Currently there are 153 employers participating in PERS DCR, including the State of Alaska, and 152 political subdivisions and public organizations.

Membership

An employee of a participating employer who first enters service on or after July 1, 2006, or a member of the defined benefit plan who works for an employer who began participation on or after July 1, 2006, and meets the following criteria is a member in the Plan:

- Permanent full-time or part-time employees of the State of Alaska, participating political subdivisions or public organizations. An employee must be regularly scheduled to work 30 or more hours per week to be considered full-time by the PERS. An employee must be regularly scheduled to work 15 or more hours per week but less than 30 hours to be considered a part-time employee for PERS purposes.
- · Elected state officials.
- Elected municipal officials who are compensated and receive at least \$2,001.00 per month.

Members can convert to PERS DCR if they are an eligible non-vested member of the PERS defined benefit plan whose employer consents to transfers to the defined contribution plan and they elect to transfer his or her account balance to PERS DCR.

Member Contributions

Other than the member-paid premiums discussed later in this section, there are no member contributions for the occupational death & disability and retiree medical benefits.

Retiree Medical Benefits

- Member must retire directly from the plan to be eligible for retiree medical coverage. Normal retirement eligibility is the earlier of a) 25 years of service as a peace officer or firefighter and 30 years of service for any other employee or b) Medicare eligible and 10 years of service.
- No subsidized retiree medical benefits are provided until normal retirement eligibility. The member's
 and any covered dependent's premium is 100% until the member is Medicare eligible. Upon the
 member's Medicare-eligibility, the required contribution will follow the service-based schedule shown
 below.
- Coverage cannot be denied except for failure to pay premium.
- Members who are receiving disability benefits or survivors who are receiving monthly survivor benefits are not eligible until the member meets, or would have met if he/she had lived, the normal retirement eligibility requirements.
- The following is a summary of the medical benefit design adopted in July 2016. The plan description below is used for valuation purposes and indicates participant cost-sharing. Please refer to the benefit handbook for more details.

Plan Design Feature	In-Network ¹	Out-of-Network ^{1 2}			
Deductible (single / family)	\$300 / \$600				
Medical services (participant share)	20%	40%			
Emergency Room Copay (non-emergent use)	\$100	\$100			
Medical Out-of-Pocket Maximum (single / family, including deductible)	\$1,500 / \$3,000	\$3,000 / \$6,000			
Medicare Coordination	Exclusion	Exclusion			
Pharmacy	No Deductible	No Deductible			
Retail Generic (per 30-day fill)	20% \$10 min / \$50 max				
Retail Non-Formulary Brand (per 30-day fill)	25% \$25 min / \$75 max	40%			
Retail Formulary Brand (per 30-day fill)	35% \$80 min / \$150 max				
Mail-Order Generic	\$20 copay				
Mail-Order Non-Formulary Brand	\$50 copay	40%			
Mail-Order Formulary Brand	\$100 copay				
Pharmacy Out-of-Pocket Max (single / family)	\$1,000 / \$2,000				
Medicare Pharmacy Arrangement	Retiree Drug Subsidy / Employer Group Waiver Plan effective 1/1/2019				
Wellness / Preventative	100% covered, not subject to deductible	20%, after deductible			

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Section 1.1 of the AlaskaCare Defined Contribution Retiree Benefit Plan states that this health plan shall be updated from time to time to reflect changes in benefits, including annual adjustments to the premium, deductible, coinsurance, medical out-of-pocket limit, and prescription drug out-of-pocket limit.

² OON applies only to non-Medicare eligible participants.

- Buck used manual rate models to determine relative plan values for the defined benefit (DB) retiree medical plan and the DCR retiree medical plan outlined above. We applied the ratio of the DCR retiree medical plan value to the per capita costs determined for each of pre/post-Medicare medical and pharmacy benefits to estimate corresponding values for the DCR retiree medical plan design. These factors are noted in Section 4.3. We further adjusted the Medicare medical manual rate to reflect the Medicare coordination method adopted. The estimated 2021 reimbursements under EGWP were provided by Segal Consulting (who worked with the EGWP administrator, Optum, to develop those estimates). We reflect estimated discounts and pharmacy rebates in the defined benefit medical cost so no further adjustment was needed for the DCR retiree medical plan. The medical network differential is reflected in the relative plan value adjustments.
- The retiree medical plan's coverage is supplemental to Medicare. Medicare coordination is described in the 2020 DCR Plan Handbook, referred to in the industry as exclusion coordination: Medicare payment is deducted from the Medicare allowable expense and plan parameters are applied to the remaining amount. Starting in 2019, the prescription drug coverage is through a Medicare Part D EGWP arrangement.
- The premium for Medicare-eligible retirees will be based on the member's years of service. The percentage of premium paid by the member is as follows:

Years of Service	Percent of Premium Paid by Member
< 15	30%
15 – 19	25%
20 – 24	20%
25 – 29	15%
30+	10%

- The premium for dependents who are not eligible for Medicare aligns with the member's subsidy. While a member is not Medicare-eligible, premiums are 100% of the estimated cost.
- Members have a separate defined contribution Health Reimbursement Arrangement account, which is not reflected in this valuation, that can be used to pay for premiums or other medical expenses.
- For valuation purposes, retiree premiums were assumed to equal the percentages outlined in the
 table above times the age-related plan costs. Future premiums calculated and charged to DCR
 participants will need to be determined reflecting any appropriate adjustments to the defined benefit
 (DB) plan data because current DB premiums were determined using information based upon
 enrollment with members who have double coverage.
- Coverage will continue for surviving spouses of covered retired members.

Occupational Disability Benefits

- Benefit is 40% of salary at date of disability.
- For Peace Officer and Firefighters there is a Disability Benefit Adjustment such that:
 - The disability benefit is increased by 75% of the cost of living increase in the preceding calendar year or 9%, whichever is less.
 - At the time the disabled member retires, the retirement benefit will be increased by a percentage
 equal to the total cumulative percentage that has been applied to the disability benefit. Monthly
 annuity payments are made from the member's contribution balance until the fund is exhausted,
 at which the plan pays all remaining payments.
- For Others, there is no increase in the occupational disability benefit after commencement.
- Member earns service while on occupational disability.
- Benefits cease when the member becomes eligible for normal retirement at Medicare-eligible age and 10 years of service, or at any age with 30 years of service for Others members or 25 years of service for Peace Officer/Firefighter members.
- Peace Officer/Firefighter members may select the defined contribution account or the monthly benefit
 payable as if they were retiring under Tier 3 (service continues during disability, final average salary is
 as of date of disability), but with payments first made from the member's DC account until it's
 exhausted.
- No subsidized retiree medical benefits are provided until normal retirement eligibility. The member's premium is 100% of the estimated cost until they are Medicare eligible. Medicare-eligible premiums follow the service-based schedule above.

Occupational Death Benefits

- Benefit is 40% of salary for Others members and 50% of salary for Peace Officer/Firefighter members.
- Survivor's Pension Adjustment: A survivor's pension is increased by 50% of the cost of living increase in the preceding calendar year or 6%, whichever is less, if the recipient is at least age 60 on July 1, or under age 60 if the recipient has been receiving PERS benefits for at least 5 years as of July 1.
- Benefits cease when the member would have become eligible for normal retirement.
- The period during which the survivor is receiving benefits is counted as service credit toward retiree medical benefits.
- No subsidized retiree medical benefits are provided until the member would have been eligible for normal retirement. The surviving spouse's premium is 100% of the estimated cost until the member would have been Medicare eligible. Medicare-eligible premiums follow the service-based schedule above.

Changes Since the Prior Valuation

There have been no changes in PERS DCR benefit provisions valued since the prior valuation.

Section 4.2: Description of Actuarial Methods and Valuation Procedures

The funding method used in this valuation was adopted by the Board in October 2006, and was modified as part of the experience study for the period July 1, 2013 to June 30, 2017. The asset smoothing method used to determine valuation assets was implemented effective June 30, 2006.

Benefits valued are those delineated in Alaska State statutes as of the valuation date. Changes in State statutes effective after the valuation date are not taken into consideration in setting the assumptions and methods.

Actuarial Cost Method

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method, level percent of pay. Each year's difference between actual and expected unfunded actuarial accrued liability is amortized over 25 years as a level percentage of expected payroll.

Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year for death and disability benefits and retiree medical benefits, from the assumed entry age to the last age with a future benefit were applied to the projected benefits to determine the normal cost (the portion of the total cost of the plan allocated to the current year under the method). The normal cost is determined by summing intermediate results for active members and determining an average normal cost rate which is then related to the total DCR Plan payroll of active members. The actuarial accrued liability for active members (the portion of the total cost of the plan allocated to prior years under the method) was determined as the excess of the actuarial present value of projected benefits over the actuarial present value of future normal costs.

The actuarial accrued liability for beneficiaries and disabled members currently receiving benefits (if any) was determined as the actuarial present value of the benefits expected to be paid. No future normal costs are payable for these members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of plan assets measured on the valuation date.

Under this method, experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

Valuation of Assets

Effective June 30, 2006, the asset valuation method recognizes 20% of the investment gain or loss in each of the current and preceding four years. This method was phased in over five years. Fair Value of Assets was \$0 as of June 30, 2006. All assets are valued at fair value. Assets are accounted for on an accrued basis and are taken directly from financial statements audited by KPMG LLP. Valuation assets are constrained to a range of 80% to 120% of the fair value of assets.

Changes in Methods Since the Prior Valuation

There were no changes in the asset or valuation methods since the prior valuation.

Valuation of Retiree Medical and Prescription Drug Benefits

The methodology used for the valuation of the retiree medical benefits is described in Section 5.2 of the State of Alaska Public Employees' Retirement System Defined Benefit Plan Actuarial Valuation Report as of June 30, 2020.

Due to the lack of experience for the DCR retiree medical plan only, base claims costs are based on those described in the actuarial valuation as of June 30, 2020 for the Defined Benefit (DB) retiree medical plan covering TRS and PERS. The DB rates were used with some adjustments. The claims costs were adjusted to reflect the differences between the DCR medical plan and the DB medical plan. These differences include network steerage, different coverage levels, different Medicare coordination for medical benefits, and an indexing of the retiree out-of-pocket dollar amounts. To account for higher initial copays, deductibles and out-of-pocket limits, projected FY21 claims costs were reduced 3.1% for medical claims, and 8.9% for prescription drugs. In addition, to account for the difference in Medicare coordination, projected FY21 medical claims costs for Medicare eligible retirees were further reduced 29.5%.

FY19 and FY20 experience were compared to assess the impact of COVID-19 and whether an adjustment to FY20 claims was indicated for use in the June 30, 2020 valuation. A material decrease in medical claims during March 2020 to June 2020 was experienced due to COVID-19. Therefore, an adjustment was made for those months to adjust for the decrease that is not expected to continue in future years. There was an observed spike in prescription drug claims in March 2020; however, the FY20 prescription drug experience appears reasonable to use without adjustment for COVID-19. To adjust for the decrease in medical claims due to COVID-19 during the last 4 months of FY20, the per capita cost during the first 8 months was used as the basis for estimating claims that would have occurred in the absence of COVID-19.

No implicit subsidies are assumed. Employees projected to retire with 30 years of service (25 years of service for Peace/Fire) prior to Medicare are valued with commencement deferred to Medicare eligibility because those members will be required to pay the full plan premium prior to Medicare. Explicit subsidies for disabled and normal retirement are determined using the plan-defined percentages of age-related total projected plan costs, again with no implicit subsidy assumed.

The State transitioned to an Employer Group Waiver Program (EGWP) for DCR participants effective January 1, 2019. The estimated 2021 reimbursements under EGWP were provided by Segal Consulting (who worked with the EGWP administrator, Optum, to develop those estimates).

Healthcare Reform

Healthcare Reform legislation passed on March 23, 2010 included several provisions with potential implications for the State of Alaska Retiree Health Plan liability. Buck evaluated the impact due to these provisions.

Because the State plan is retiree-only, not all provisions are required. Unlimited lifetime benefits and dependent coverage to age 26 are two of these provisions. The adopted DCR plan does not place lifetime limits on benefits, but does restrict dependent child coverage.

The Further Consolidated Appropriations Act, 2020 passed in December 2019 repealed several healthcare-related taxes, including the Cadillac Tax.

The Tax Cuts and Jobs Act passed in December 2017 included the elimination of the individual mandate penalty and changed the inflation measure for purposes of determining the limits for the High Cost Excise Tax to use chained CPI. It is our understanding the law does not directly impact other provisions of the ACA. While the nullification of the ACA's individual mandate penalty does not directly impact employer group health plans, it could contribute to the destabilization of the individual market and increase the number of uninsured. Such destabilization could translate to increased costs for employers. We have considered this when setting our healthcare cost trend assumptions and will continue to monitor this issue.

We have not identified any other specific provisions of healthcare reform or its potential repeal that would be expected to have a significant impact on the measured obligation. We will continue to monitor legislative activity.

Section 4.3: Summary of Actuarial Assumptions

The demographic and economic assumptions used in the June 30, 2020 valuation are described below. Unless noted otherwise, these assumptions were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017.

Investment Return

7.38% per year, net of investment expenses.

Salary Scale

Salary scale rates based upon the 2013-2017 actual experience (see Table 1).

Inflation – 2.50% per year.

Productivity – 0.25% per year.

Payroll Growth

2.75% per year (inflation + productivity).

Total Inflation

Total inflation as measured by the Consumer Price Index for urban and clerical workers for Anchorage is assumed to increase 2.50% annually.

Mortality (Pre-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

100% (male and female) of RP-2014 employee table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Deaths are assumed to result from occupational causes 75% of the time for Peace Officer/Firefighters, and 40% of the time for Others.

Mortality (Post-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

91% of male and 96% of female rates of RP-2014 healthy annuitant table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Turnover

Select and ultimate rates based upon the 2013-2017 actual experience (see Tables 2a and 2b).

Disability

Incidence rates based upon the 2013-2017 actual experience (see Table 3).

Disabilities are assumed to be occupational 75% of the time for Peace Officer/Firefighters, and 40% of the time for Others. For Peace Officer/Firefighters, members are assumed to take the monthly annuity 100% of the time.

Post-disability mortality in accordance with the RP-2014 disabled table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Retirement

Retirement rates based upon the 2013-2017 actual experience (see Table 4).

Spouse Age Difference

Males are assumed to be three years older than their wives. Females are assumed to be two years younger than husbands.

Percent Married for Occupational Death & Disability

For Others, 75% of male members and 70% of female members are assumed to be married. For Peace Officer/Firefighters, 85% of male members and 60% of female members are assumed to be married.

Dependent Spouse Medical Coverage Election

Applies to members who do not have double medical coverage. For Others, 65% of male members and 60% of female members are assumed to be married and cover a dependent spouse. For Peace Officer/Firefighters, 75% of male members and 50% of female members are assumed to be married and cover a dependent spouse.

Part-Time Status

Part-time employees are assumed to earn 1.00 years of credited service per year for Peace Officer/Firefighter and 0.75 years of credited service per year for Other members.

Peace Officer / Firefighter Occupational Disability Retirement Benefit Commencement

The occupational disability retirement benefit is assumed to be first payable from the member's DC account and the retirement benefit payable from the occupational death and disability trust will commence five years later.

Per Capita Claims Cost

Sample claims cost rates (before base claims cost adjustments described below) adjusted to age 65 for FY21 medical and prescription drugs are shown below:

	Medical	Prescription Drug		
Pre-Medicare	\$ 15,360	\$	3,393	
Medicare Parts A & B	\$ 1,618	\$	3,340	
Medicare Part D – EGWP	N/A	\$	1,003	

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2021 fiscal year (July 1, 2020 – June 30, 2021).

The EGWP subsidy is assumed to increase in future years by the trend rates shown on the following pages. No future legislative changes or other events are anticipated to impact the EGWP subsidy. If any legislative or other changes occur in the future that impact the EGWP subsidy (which could either increase or decrease the plan's Actuarial Accrued Liability), those changes will be evaluated and quantified when they occur.

Third Party Administrator Fees

\$449 per person per year; assumed to increase at 4.5% per year.

Base Claims Cost Adjustments

Due to higher initial copays, deductibles, out-of-pocket limits and member cost sharing compared to the DB medical plan, the following cost adjustments are applied to the per capita claims cost rates above:

- 0.969 for the pre-Medicare plan.
- 0.674 for both the Medicare medical plan and Medicare coordination method (3.1% reduction for the medical plan and 29.5% reduction for the coordination method).
- 0.911 for the prescription drug plan.

Administrative Expenses

Beginning with the June 30, 2018 valuation, the Normal Cost is increased for administrative expenses expected to be paid from plan assets during the year. The amounts included in the June 30, 2020 Normal Cost, which are based on the average of actual administrative expenses during the last two fiscal years, are \$1,000 for occupational death & disability and \$20,000 for retiree medical.

Healthcare Cost Trend

The table below shows the rate used to project the cost from the shown fiscal year to the next fiscal year. For example, 6.5% is applied to the FY21 pre-Medicare medical claims costs to get the FY22 medical claims costs.

	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY21	6.5%	5.4%	7.5%
FY22	6.3%	5.4%	7.1%
FY23	6.1%	5.4%	6.8%
FY24	5.9%	5.4%	6.4%
FY25	5.8%	5.4%	6.1%
FY26	5.6%	5.4%	5.7%
FY27-FY40	5.4%	5.4%	5.4%
FY41	5.3%	5.3%	5.3%
FY42	5.2%	5.2%	5.2%
FY43	5.1%	5.1%	5.1%
FY44	5.1%	5.1%	5.1%
FY45	5.0%	5.0%	5.0%
FY46	4.9%	4.9%	4.9%
FY47	4.8%	4.8%	4.8%
FY48	4.7%	4.7%	4.7%
FY49	4.6%	4.6%	4.6%
FY50+	4.5%	4.5%	4.5%

For the June 30, 2014 valuation and later, the updated Society of Actuaries' Healthcare Cost Trend Model is used to project medical and prescription drug costs. This model estimates trend amounts that are projected out for 80 years. The model has been populated with assumptions that are specific to the State of Alaska.

Aging Factors

Age	Medical	Prescription Drugs
0 – 44	2.0%	4.5%
45 – 54	2.5%	3.5%
55 – 64	2.5%	1.5%
65 – 74	3.0%	2.0%
75 – 84	2.0%	-0.5%
85 – 94	0.3%	-2.5%
95+	0.0%	0.0%

Retiree Medical Participation

Decre	ment Due to Disability	Decrei	ment Due to Re	tirement
Age	Percent Participation	Age	Percent Part	icipation*
< 56	75.0%	55	50.0	%
56	77.5%	56	55.0	%
57	80.0%	57	60.0	%
58	82.5%	58	65.0	%
59	85.0%	59	70.0	%
60	87.5%	60	75.0	%
61	90.0%	61	80.0	%
62	92.5%	62	85.0	%
63	95.0%	63	90.0	%
64	97.5%	64	95.0	%
65+	100.0%	65+	Years of S	Service
			< 15	75.0%
			15 – 19	80.0%
			20 - 24	85.0%
			25 – 29	90.0%
			30+	95.0%

^{*} Participation assumption is a combination of (i) the service-based rates for retirement from employment at age 65+ and (ii) the age-based rates for retirement from employment before age 65. These rates reflect the expected plan election rate that varies by reason for decrement, duration that a member may pay full cost prior to Medicare eligibility, and availability of alternative and/or lower cost options, particularly in the Medicare market. This assumption is based on observed trends in participation from a range of other plans.

Imputed Data

Data changes from the prior year which are deemed to have immaterial impact on liabilities and contribution rates are assumed to be correct in the current year's client data. Non-vested terminations with appropriate refund dates are assumed to have received a full refund of contributions. Active members with missing salary and service are assumed to be terminated with status based on their vesting percentage.

Changes in Assumptions Since the Prior Valuation

The amounts included in the Normal Cost for administrative expenses were changed from \$600 to \$1,000 for occupational death & disability, and from \$8,750 to \$20,000 for retiree medical (based on the most recent two years of actual administrative expenses paid from plan assets). The per capita claims cost assumption is updated annually. The medical and prescription drug relative value factors were updated and the 0.2% annual trend rate adjustment factor between the DB and DCR plans was removed.

Table 1: Salary Scales

Peace Office	r / Firefighter	Oth	iers
Years of Service	Percent Increase	Years of Service	Percent Increase
0	7.75%	0	6.75%
1	7.25%	1	6.25%
2	6.75%	2	5.75%
3	6.25%	3	5.25%
4	5.75%	4	4.75%
5	5.25%	5	4.25%
6	4.75%	6	3.75%
7	4.25%	7	3.65%
8	3.75%	8	3.55%
9	3.65%	9	3.45%
10	3.55%	10	3.35%
11	3.45%	11	3.25%
12	3.35%	12	3.15%
13	3.25%	13	3.05%
14	3.15%	14	2.95%
15	3.05%	15	2.85%
16	2.95%	16	2.75%
17	2.85%	17	2.75%
18+	2.75%	18+	2.75%

Table 2a: Turnover Rates for Peace Officer / Firefighter

Select Rates during the First 5 Years of Employment

Years of Service	Male	Female
0	18.90%	20.63%
1	14.18%	16.50%
2	10.50%	13.75%
3	9.45%	12.38%
4	8.40%	11.00%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	5.52%	11.97%	44	5.78%	11.09%
23	5.65%	11.97%	45	5.71%	11.03%
24	5.78%	11.97%	46	5.64%	10.98%
25	5.91%	11.97%	47	5.57%	10.92%
26	6.04%	11.97%	48	6.01%	10.84%
27	6.16%	11.97%	49	6.45%	10.75%
28	6.16%	11.94%	50	6.89%	10.67%
29	6.15%	11.91%	51	7.32%	10.58%
30	6.14%	11.88%	52	7.76%	10.50%
31	6.14%	11.84%	53	7.97%	10.66%
32	6.12%	11.81%	54	8.18%	10.82%
33	6.11%	11.79%	55	8.38%	10.98%
34	6.09%	11.77%	56	8.59%	11.15%
35	6.08%	11.75%	57	8.80%	11.31%
36	6.07%	11.72%	58	9.03%	11.47%
37	6.05%	11.70%	59	9.25%	11.63%
38	6.03%	11.60%	60	9.48%	11.79%
39	6.00%	11.50%	61	9.71%	11.95%
40	5.98%	11.40%	62	9.94%	12.12%
41	5.95%	11.30%	63	12.37%	12.28%
42	5.93%	11.20%	64	14.81%	12.44%
43	5.85%	11.14%	65+	17.25%	12.60%

Table 2b: Turnover Rates for Others

Select Rates during the First 5 Years of Employment

Years of Service	Male	Female
0	24.36%	27.98%
1	21.00%	22.31%
2	16.80%	17.85%
3	13.44%	14.28%
4	9.45%	12.34%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female	Age	Male	Female
< 23	13.71%	16.50%	44	7.83%	8.22%
23	13.71%	16.51%	45	7.72%	7.90%
24	13.71%	16.51%	46	7.60%	7.58%
25	13.71%	16.52%	47	7.48%	7.26%
26	13.71%	16.53%	48	7.68%	7.23%
27	13.71%	16.54%	49	7.87%	7.20%
28	13.41%	15.94%	50	8.07%	7.17%
29	13.21%	15.34%	51	8.26%	7.14%
30	12.82%	17.75%	52	8.46%	7.11%
31	12.52%	14.15%	53	8.46%	7.26%
32	12.22%	13.55%	54	8.47%	7.42%
33	11.65%	12.90%	55	8.48%	7.57%
34	11.09%	12.24%	56	8.48%	7.72%
35	10.52%	11.58%	57	8.49%	7.88%
36	9.95%	10.92%	58	8.77%	8.15%
37	9.39%	10.26%	59	9.08%	8.42%
38	9.12%	9.98%	60	9.32%	8.69%
39	8.86%	9.70%	61	9.60%	8.96%
40	8.60%	9.42%	62	9.88%	9.24%
41	8.32%	9.14%	63	10.28%	10.51%
42	8.07%	8.86%	64	10.68%	11.78%
43	7.95%	8.54%	65+	11.08%	13.05%

Table 3: Disability Rates

	Peace Office	r / Firefighter	Oth	ers
Age	Male	Female	Male	Female
< 23	0.0179%	0.0112%	0.0327%	0.0376%
23	0.0244%	0.0153%	0.0360%	0.0400%
24	0.0310%	0.0194%	0.0392%	0.0424%
25	0.0374%	0.0234%	0.0425%	0.0448%
26	0.0440%	0.0275%	0.0456%	0.0472%
27	0.0505%	0.0316%	0.0489%	0.0496%
28	0.0526%	0.0329%	0.0501%	0.0510%
29	0.0548%	0.0343%	0.0513%	0.0524%
30	0.0570%	0.0356%	0.0524%	0.0538%
31	0.0591%	0.0370%	0.0536%	0.0554%
32	0.0612%	0.0383%	0.0548%	0.0568%
33	0.0634%	0.0397%	0.0566%	0.0586%
34	0.0657%	0.0411%	0.0584%	0.0606%
35	0.0679%	0.0425%	0.0602%	0.0624%
36	0.0702%	0.0439%	0.0620%	0.0644%
37	0.0724%	0.0453%	0.0638%	0.0662%
38	0.0757%	0.0473%	0.0669%	0.0696%
39	0.0789%	0.0493%	0.0701%	0.0728%
40	0.0822%	0.0514%	0.0734%	0.0762%
41	0.0854%	0.0534%	0.0765%	0.0794%
42	0.0886%	0.0554%	0.0797%	0.0826%
43	0.0977%	0.0611%	0.0879%	0.0908%
44	0.1066%	0.0667%	0.0962%	0.0990%
45	0.1157%	0.0723%	0.1043%	0.1072%
46	0.1247%	0.0780%	0.1125%	0.1154%
47	0.1337%	0.0836%	0.1208%	0.1236%
48	0.1462%	0.0914%	0.1329%	0.1360%
49	0.1588%	0.0993%	0.1451%	0.1484%
50	0.1714%	0.1071%	0.1572%	0.1608%
51	0.1839%	0.1150%	0.1694%	0.1734%
52	0.1965%	0.1228%	0.1815%	0.1858%
53	0.2294%	0.1434%	0.2132%	0.2168%
54	0.2624%	0.1640%	0.2450%	0.2478%

Table 4: Retirement Rates

Age	Rate
< 55	2.0%
55	3.0%
56	3.0%
57	3.0%
58	3.0%
59	3.0%
60	5.0%
61	5.0%
62	10.0%
63	5.0%
64	5.0%
65	25.0%
66	25.0%
67	25.0%
68	20.0%
69	20.0%
70+	100.0%

Glossary of Terms

Actuarial Accrued Liability

Total accumulated cost to fund pension or postemployment benefits arising from service in all prior years.

Actuarial Cost Method

Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension or postemployment plan for a group of plan members to the years of service that give rise to that cost.

Actuarial Present Value of Projected Benefits

Amount which, together with future interest, is expected to be sufficient to pay all future benefits.

Actuarial Valuation

Study of probable amounts of future pension or postemployment benefits and the necessary amount of contributions to fund those benefits.

Actuary

Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.

GASB 74 and 75

Governmental Accounting Standards Board Statement Number 74 amends Number 43 effective for the fiscal year beginning after June 15, 2016 and defines new financial reporting requirements for public postemployment benefit plans. Governmental Accounting Standards Board Statement Number 75 amends Number 45 effective for fiscal years beginning after June 15, 2017 and defines new accounting and financial reporting requirements for employers sponsoring public postemployment benefit plans.

Normal Cost

That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.

Rate Payroll

Members' earnings used to determine contribution rates.

Unfunded Actuarial Accrued Liability (UAAL)

The portion of the actuarial accrued liability not offset by plan assets.

Valuation Payroll

Members' earnings used to determine Normal Cost and Actuarial Accrued Liability.

Vested Benefits

Benefits which are unconditionally guaranteed regardless of employment.



State of Alaska

Teachers'
Retirement System

Actuarial Valuation Report As of June 30, 2020

May 2021



May 20, 2021

State of Alaska
The Alaska Retirement Management Board
The Department of Revenue, Treasury Division
The Department of Administration, Division of Retirement and Benefits
P.O. Box 110203
Juneau, AK 99811-0203

Certification of Actuarial Valuation

Dear Members of The Alaska Retirement Management Board, The Department of Revenue and The Department of Administration:

This report summarizes the annual actuarial valuation results of the State of Alaska Teachers' Retirement System (TRS) as of June 30, 2020 performed by Buck Global, LLC (Buck). This report is an update to the draft report dated January 22, 2021, reflecting minor wording changes.

The actuarial valuation is based on financial information provided in the financial statements audited by KPMG LLP, member data provided by the Division of Retirement and Benefits, and medical enrollment data provided by the healthcare claims administrator (Aetna), as summarized in this report. The benefits considered are those delineated in Alaska statutes effective June 30, 2020. The actuary did not verify the data submitted, but did perform tests for consistency and reasonableness.

All costs, liabilities and other factors under TRS were determined in accordance with generally accepted actuarial principles and procedures. An actuarial cost method is used to measure the actuarial liabilities which we believe is reasonable. Buck is solely responsible for the actuarial data and actuarial results presented in this report. This report fully and fairly discloses the actuarial position of TRS as of June 30, 2020.

TRS is funded by Employer, State, and Member Contributions in accordance with the funding policy adopted by the Alaska Retirement Management Board (Board) and as required by Alaska state statutes. The funding objective for TRS is to pay required contributions that remain level as a percent of total TRS compensation. The Board has also established a funding policy objective that the required contributions be sufficient to pay the Normal Costs of active plan members, plan expenses, and amortize the Unfunded Actuarial Accrued Liability (UAAL) as a level percentage of total TRS compensation over a closed 25-year period as required by Alaska state statutes. The closed 25-year period was originally established effective June 30, 2014. Effective June 30, 2018, the Board adopted a 25-year layered UAAL amortization method as described in Section 5.2. The UAAL amortization continues to be on a level percent of pay basis. The compensation used to determine required contributions is the total compensation of all active members in TRS, including those hired after July 1, 2006 who are members of the Defined Contribution Retirement (DCR) Plan. This objective is currently being met and is projected to continue to be met. Absent future gains/losses, actuarially determined contributions are expected to remain level as a percent of pay and the overall funded status (on a combined pension/healthcare basis) is expected to increase to 100% in FY35.

The Board and staff of the State of Alaska may use this report for the review of the operations of TRS. Use of this report, for any other purpose or by anyone other than the Board or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, you should ask Buck to review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without the review by Buck.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. In particular, retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the plan and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience under the plan. The actuary performs an analysis of plan experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience. The last full experience analysis was performed for the period July 1, 2013 to June 30, 2017. Based on that experience study, the Board adopted new assumptions effective beginning with the June 30, 2018 valuation to better reflect expected future experience. Based on our annual analysis of recent claims experience, changes were made to the per capita claim cost rates effective June 30, 2020 to better reflect expected future healthcare experience. A summary of the actuarial assumptions and methods used in this actuarial valuation is shown in Sections 5.2 and 5.3. We certify that the assumptions and methods described in Sections 5.2 and 5.3 of this report meet the requirements of all applicable Actuarial Standards of Practice.

Governmental Accounting Standards Board (GASB) Statement No. 67 (GASB 67) was effective for TRS beginning with fiscal year ending June 30, 2014, and Statement No. 74 (GASB 74) was effective for TRS beginning with fiscal year ending June 30, 2017. Separate GASB 67 and GASB 74 reports as of June 30, 2020 have been prepared. We have also prepared the member data tables shown in Section 4 of this report for the Statistical Section of the CAFR, as well as the summary of actuarial assumptions and analysis of financial experience for the Actuarial Section of the CAFR. Please see our separate GASB 67 and GASB 74 reports for other information needed for the CAFR.

Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) applies to actuaries performing funding calculations related to a pension plan. ASOP 51 does not apply to actuaries performing services in connection with other post-employment benefits, such as medical benefits. Accordingly, ASOP 51 does not apply to the healthcare portion of TRS. See Section 6 of this report for further details regarding ASOP 51.

Use of Models

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under

the funding methods specified in this report. The output from the third-party vendor software is used as input to internally developed models that apply applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal models are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal models, extra checking and review are completed. Significant changes to the internal models that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

Additional models used in valuing health benefits are described later in the report.

COVID-19

The potential impact of the ongoing COVID-19 pandemic on costs and liabilities was considered and an adjustment was made in setting the medical per capita claims cost assumption. FY20 medical claims were adjusted for a COVID-19 related decline in claims during the last four months (March – June) of FY20. A more detailed explanation on these adjustments is shown in Section 5.2.

This report was prepared under my supervision and in accordance with all applicable Actuarial Standards of Practice. I am a Fellow of the Society of Actuaries, an Enrolled Actuary, a Fellow of the Conference of Consulting Actuaries, and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

I am available to discuss this report with you at your convenience. I can be reached at 602-803-6174.

Respectfully submitted,

0.LKL

David J. Kershner, FSA, EA, MAAA, FCA

Principal Buck

The undersigned actuary is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms his qualification to render opinions in such matters in accordance with the Qualification Standards of the American Academy of Actuaries.

Scott Young, FSA, EA, MAAA, FCA

Scott young

Director Buck

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Executive Summary

Overview

The State of Alaska Teachers' Retirement System (TRS) provides pension and postemployment healthcare benefits to teachers and other eligible participants. The Commissioner of the Department of Administration is responsible for administering the plan. The Alaska Retirement Management Board has fiduciary responsibility over the assets of the plan. This report presents the results of the actuarial valuation of TRS as of the valuation date of June 30, 2020.

Purpose

An actuarial valuation is performed on the plan annually as of the end of the fiscal year. The main purposes of the actuarial valuation detailed in this report are:

- 1. To determine the Employer/State contribution necessary to meet the Board's funding policy for the plan;
- 2. To disclose the funding assets and liability measures as of the valuation date;
- 3. To review the current funded status of the plan and assess the funded status as an appropriate measure for determining future actuarially determined contributions;
- 4. To compare actual and expected experience under the plan during the last fiscal year; and
- 5. To report trends in contributions, assets, liabilities, and funded status over the last several years.

The actuarial valuation provides a "snapshot" of the funded position of TRS based on the plan provisions, membership data, assets, and actuarial methods and assumptions as of the valuation date.

Actuarial projections are also performed to provide a long-term view of the expected future funded status and contribution patterns (see Section 3). The future funded status and contribution patterns would be different than those shown in Section 3 if future experience does not match the actuarial assumptions used in the projections.

Retiree group benefits models necessarily rely on the use of approximations and estimates, and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements.

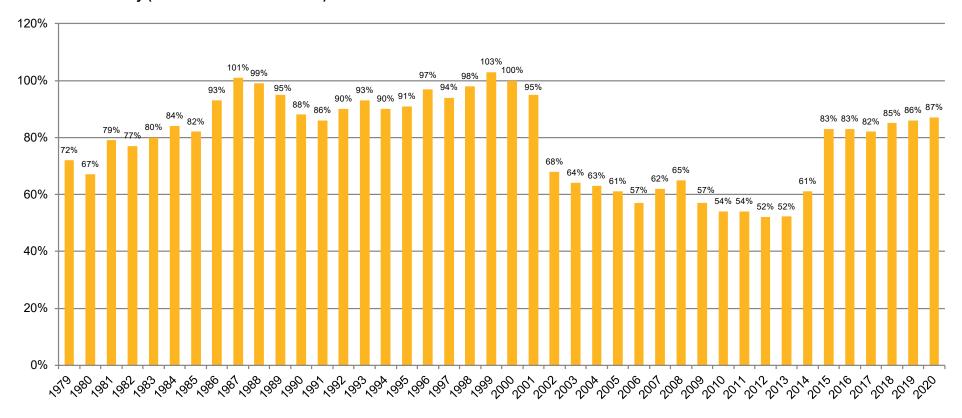
Funded Status

Where presented, references to "funded ratio" and "unfunded actuarial accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

1

Fund	ed Status as of June 30 (\$'s in 000's)		2019		2020
Pens	ion				
a.	Actuarial Accrued Liability	\$	7,388,020	\$	7,447,036
b.	Valuation Assets	*	5,563,931	Ŧ	5,587,064
C.	Unfunded Actuarial Accrued Liability, (a) - (b)	\$	1,824,089	\$	1,859,972
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)		75.3%		75.0%
e.	Fair Value of Assets	\$	5,511,929	\$	5,444,799
f.	Funded Ratio based on Fair Value of Assets, (e) \div (a)		74.6%		73.1%
Healt	hcare				
a.	Actuarial Accrued Liability	\$	2,518,644	\$	2,489,675
b.	Valuation Assets		2,947,562		3,021,283
C.	Unfunded Actuarial Accrued Liability, (a) - (b)	\$	(428,918)	\$	(531,608)
d.	Funded Ratio based on Valuation Assets, (b) \div (a)		117.0%		121.4%
e.	Fair Value of Assets	\$	2,929,319	\$	2,953,461
f.	Funded Ratio based on Fair Value of Assets, (e) \div (a)		116.3%		118.6%
Total					
a.	Actuarial Accrued Liability	\$	9,906,664	\$	9,936,711
b.	Valuation Assets		8,511,493		8,608,347
C.	Unfunded Actuarial Accrued Liability, (a) - (b)	\$	1,395,171	\$	1,328,364
d.	Funded Ratio based on Valuation Assets, (b) \div (a)		85.9%		86.6%
e.	Fair Value of Assets	\$	8,441,248	\$	8,398,260
f.	Funded Ratio based on Fair Value of Assets, (e) \div (a)		85.2%		84.5%

Funded Ratio History (Based on Valuation Assets)



The key reasons for the change in the funded status are explained below. The funded status for healthcare benefits is not necessarily an appropriate measure to confirm that assets are sufficient to settle health plan obligations as there are no available financial instruments for purchase. Future experience is likely to vary from assumptions, so there is potential for actuarial gains or losses.

1. Investment Experience

The actuarial asset value was reinitialized to equal fair value of assets as of June 30, 2014. Beginning in FY15, the asset valuation method recognizes 20% of the investment gain or loss each year, for a period of five years. The FY20 investment return based on fair value of assets was approximately 4.1% compared to the expected investment return of 7.38% (net of investment expenses of approximately 0.29%). This resulted in a market asset loss of approximately \$274 million. Due to the recognition of investment gains and losses over a 5-year period, the FY20 investment return based on actuarial value of assets was approximately 5.8%, which resulted in an actuarial asset loss of approximately \$140 million.

2. Salary Increases

Salary increases for continuing active members during FY20 were less than expected based on the valuation assumptions, resulting in a liability gain of approximately \$6 million.

3. Demographic Experience

Section 4 provides statistics on active and inactive participants. The number of active participants decreased 6.3% from 4,044 at June 30, 2019 to 3,789 at June 30, 2020 due to active members exiting the plan during the year (due to retirement, termination, death, and disability) and the closure of the plan to new entrants as of July 1, 2006. The average age of active participants increased from 51.48 to 51.92 and average credited service increased from 19.21 to 19.76 years.

The number of benefit recipients increased 1.5% from 13,491 to 13,689, and their average age increased from 71.30 to 71.85. The number of vested terminated participants decreased 5.9% from 812 to 764. Their average age increased from 51.71 to 52.37.

The overall effect of the demographic experience during FY20 was a liability loss of approximately \$15 million (pension) and a liability gain of approximately \$81 million (healthcare).

4. COLA / PRPA Experience

The cost-of-living increases (COLA) for benefit recipients during FY20 were less than expected based on the valuation assumptions, resulting in a liability gain of approximately \$2 million. The postretirement pension adjustments (PRPA) were also less than expected, resulting in a liability gain of approximately \$41 million.

5. Retiree Medical Claims Experience

As described in Section 5.2, recent medical claims experience and changes in healthcare enrollment data provided to us for the June 30, 2020 valuation generated a liability gain of approximately \$98 million. The decrease in retired member contributions from CY20 to CY21 generated a liability loss of approximately \$1 million. Reduced claims during FY20, largely attributable to COVID-19, generated a liability gain of approximately \$17 million.

6. Changes in Methods Since the Prior Valuation

There were no changes in actuarial methods since the prior valuation.

¹ Includes the effects of changes in dependent coverage elections and Medicare Part B only experience.

7. Changes in Assumptions Since the Prior Valuation

Healthcare claim costs are updated annually as described in Section 5.2. Retired member contributions were updated to reflect the 5% decrease from CY20 to CY21. The amounts included in the Normal Cost for administrative expenses were updated based on the last two years of actual administrative expenses paid from plan assets. There were no other changes in actuarial assumptions since the prior valuation.

8. Changes in Benefit Provisions Since the Prior Valuation

There have been no changes in benefit provisions valued since the prior valuation.

Comparative Summary of Contribution Rates

JO,	diana danimary or domination reactor		
Pens	sion	Actual FY 2022	Estimated FY 2023
a.	Normal Cost Rate Net of Member Contributions	2.40%	2.24%
b.	Past Service Cost Rate	20.11%	<u>20.17%</u>
C.	Total Employer/State Contribution Rate, (a) + (b), not less than (a) ¹	22.51%	22.41%
Heal	thcare	Actual FY 2022	Estimated FY 2023
a.	Normal Cost Rate	2.98%	2.72%
b.	Past Service Cost Rate	<u>(4.09)%</u>	(5.39)%
C.	Total Employer/State Contribution Rate, (a) + (b), not less than (a) ¹	2.98%	2.72%
Tota		Actual FY 2022	Estimated FY 2023
a.	Normal Cost Rate Net of Member Contributions	5.38%	4.96%
b.	Past Service Cost Rate	<u>20.11%</u>	<u>20.17%</u>
C.	Total Employer/State Contribution Rate, (a) + (b) ¹	25.49%	25.13%
d.	Board Adopted Total Employer/State Contribution Rate	25.49%	TBD

Contribution rates are based on total (DB and DCR) payroll. The contribution rates shown above for FY23 are estimated assuming no actuarial gains/losses during FY21 and FY22. Actual FY23 contribution rates will be adopted by the Board in September 2021 reflecting FY21 asset experience.

Contribution rates include Employer contribution rates as limited by Alaska state statutes and the Additional State Contribution required under SB 125.

Defined Contribution Retirement (DCR) Rate Paid by Employers

Board Adopted Total Rate, Including DCR Rate Paid by Employers,

(d) + (e)

6.72%

TBD

6.36%

31.85%

Beginning with the June 30, 2014 valuation, contribution rates for FY17 and beyond are determined using new methodology in accordance with 2014 legislation under HB 385 and SB 119, 2014 Alaska Laws, which changed the amortization methodology to a closed 25-year period as a level percentage of pay, and eliminated the time lag on the contribution rate calculation by using a 2-year "roll-forward" approach assuming 0% population growth. Investment gains and losses are recognized over a 5-year period beginning in FY15. Beginning with the June 30, 2018 valuation, the UAAL amortization was changed as described in Section 5.2.

Summary of Actuarial Accrued Liability Gain/(Loss) and Other Changes During the Year

The following table summarizes the sources of change in the total Employer/State contribution rate as of June 30, 2019 and June 30, 2020 based on DB and DCR payroll combined:

		Pension	Healthcare	Total
1. Total Empl	oyer/State Contribution Rate as of June 30, 2019	21.41%	3.57%	24.98%
2. Change du	ue to:			
a. Health	n Claims Experience	N/A	(0.95)%	(0.95)%
b. Salary	Increases	(0.06)%	N/A	(0.06)%
c. Invest	ment Experience	0.83%	0.38%	1.21%
d. Demo	graphic Experience and Miscellaneous ¹	(0.28)%	0.49%	0.21%
e. Actua	l vs Expected Contributions	(0.17)%	(0.19)%	(0.36)%
f. Assun	nption Changes	0.00%	0.00%	0.00%
g. Total	Change, (a) + (b) + (c) + (d) + (e) + (f)	0.32%	(0.27)%	0.05%
3. Total Empl (1) + (2)(g)	oyer/State Contribution Rate as of June 30, 2020,	21.73%	3.30%	25.03%

The following table shows the FY20 gain/(loss) on actuarial accrued liability as of June 30, 2020 (\$'s in 000's):

	Pension	Healthcare	Total
Retirement Experience	\$ 4,822	\$ 2,189	\$ 7,011
Termination Experience	(8,327)	(1,260)	(9,587)
Disability Experience	(337)	31	(306)
Active Mortality Experience	1,370	(564)	806
Inactive Mortality Experience	(12,531)	(1,712)	(14,243)
Salary Increases	6,443	N/A	6,443
Rehires (Net of Rehire Load)	(691)	5,506	4,815
COLA Increases	2,280	N/A	2,280
PRPA Increases	41,109	N/A	41,109
Per Capita Claims Cost	N/A	96,760	96,760
COVID-19 Experience ²	N/A	17,345	17,345
Medicare Part B Only Experience	N/A	2,089	2,089
Changes in Dependent Coverage Elections	N/A	7,435	7,435
Programming Changes ³	518	N/A	518
Miscellaneous ⁴	(3,776)	(4,433)	(8,209)
Total	\$ 30,880	\$ 123,386	\$ 154,266

¹ Includes the effects of census data changes between the two valuations.

² Difference between actual and expected claims, largely attributable to COVD-19.

³ Includes adjustments to (a) the 75% PRPA for disabilities to commence immediately, and (b) the mortality applied during the COLA deferral period for Tier 2 members.

Includes the effects of various data changes that are typical when new census data is received for the annual valuation, the effects of the differences between expected and actual benefit payments, and other items that do not fit neatly into any of the other categories.

The rehire gain/(loss) amount shown on the previous page is the difference between (i) the increase in Actuarial Accrued Liability at June 30, 2020 due to rehires during the most recent plan year, and (ii) the load that was added to the June 30, 2019 Normal Cost based on the rehire load assumption used in the June 30, 2019 valuation. The development of the FY20 rehire gain/(loss) amount is shown in the table below (\$'s in 000's):

		Pe	ension	Hea	Ithcare	Total
1.	Increase/(Decrease) in Actuarial Accrued Liability at June 30, 2020 due to Rehires	\$	8,019	\$	(2,686)	\$ 5,333
2.	June 30, 2019 Normal Cost Rehire Load, with interest to June 30, 2020	\$	7,328	\$	2,820	\$ 10,148
3.	Rehire Gain/(Loss), (2) - (1)	\$	(691)	\$	5,506	\$ 4,815

Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost (\$'s in 000's)

As of June 30, 2020	Present Value of Projected Benefits		arial Accrued ast Service) Liability
Active Members			
Retirement Benefits	\$	1,918,363	\$ 1,742,632
Termination Benefits		30,139	8,750
Disability Benefits		2,174	(1,705)
Death Benefits		13,098	11,038
Return of Contributions		2,412	(35,755)
Medical and Prescription Drug Benefits		932,788	794,982
Medicare Part D Subsidy		(95,471)	(82,011)
Indebtedness		(27,277)	 (27,277)
Subtotal	\$	2,776,226	\$ 2,410,654
Inactive Members			
Not Vested	\$	39,398	\$ 39,398
Vested Terminations			
- Retirement Benefits		144,442	144,442
- Medical and Prescription Drug Benefits		249,766	249,766
- Medicare Part D Subsidy		(26,215)	(26,215)
- Indebtedness		(5,112)	(5,112)
Retirees & Beneficiaries			
- Retirement Benefits		5,570,625	5,570,625
- Medical and Prescription Drug Benefits		1,814,335	1,814,335
- Medicare Part D Subsidy		(261,182)	(261,182)
Subtotal	\$	7,526,057	\$ 7,526,057
Total	\$	10,302,283	\$ 9,936,711
Total Pension	\$	7,688,262	\$ 7,447,036
Total Medical, Net of Part D Subsidy	\$	2,614,021	\$ 2,489,675
Total Medical, Gross of Part D Subsidy	\$	2,996,889	\$ 2,859,083

As of June 30, 2020	Present Value of Projected Benefits		(Pa	arial Accrued ast Service) Liability
By Tier				
Tier 1				
- Pension	\$	4,526,587	\$	4,517,771
- Medical, Net of Part D Subsidy		1,145,879		1,141,946
Tier 2				
- Pension		3,161,675		2,929,265
- Medical, Net of Part D Subsidy		1,468,142		1,347,729
Total	\$	10,302,283	\$	9,936,711
As of June 30, 2020			No	ormal Cost
Active Members				
Retirement Benefits			\$	30,508
Termination Benefits				3,673
Disability Benefits				662
Death Benefits				379
Return of Contributions				6,658
Medical and Prescription Drug Benefits				22,867
Medicare Part D Subsidy				(2,286)
Rehire Assumption (Pension)				6,521
Rehire Assumption (Medical)				2,476
Administrative Expenses (Pension)				3,003
Administrative Expenses (Medical)				1,362
Total			\$	75,823
Total Pension			\$	51,404
Total Medical, Net of Part D Subsidy			\$	24,419
Total Medical, Gross of Part D Subsidy			\$	26,705
By Tier				
Tier 1				
- Pension			\$	3,032
- Medical, Net of Part D Subsidy				1,245
Tier 2				
- Pension				48,372
- Medical, Net of Part D Subsidy				23,174
Total			\$	75,823

Section 1.2: Actuarial Contributions as of June 30, 2020 (\$'s in 000's)

Normal Cost Rate	ŀ	Pension		Healthcare		Total
1. Total Normal Cost	\$	51,404	\$	24,419	\$	75,823
2. DB Rate Payroll Projected for FY21		349,236		349,236		349,236
3. DCR Rate Payroll Projected for FY21		391,854		391,854		391,854
4. Total Rate Payroll Projected for FY21		741,090		741,090		741,090
5. Normal Cost Rate						
a. Based on DB Rate Payroll, (1) ÷ (2)		14.72%		6.99%		21.71%
b. Based on Total Rate Payroll, (1) ÷ (4)		6.94%		3.30%		10.24%
6. Average Member Contribution Rate ¹		4.08%		0.00%		4.08%
7. Employer Normal Cost, (5)(b) - (6)		2.86%		3.30%		6.16%

Past Service Rate		Pension	H	Healthcare		Total
1. Actuarial Accrued Liability	\$	7,447,036	\$	\$ 2,489,675		9,936,711
2. Valuation Assets		5,587,064		3,021,283		8,608,347
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$	1,859,972	\$	(531,608)	\$	1,328,364
4. Funded Ratio, (2) ÷ (1)		75.0%		121.4%		86.6%
5. Past Service Cost Amortization Payment		139,825		(35,712)		104,113
6. Total Rate Payroll Projected for FY21		741,090		741,090		741,090
7. Past Service Rate, (5) ÷ (6)		18.87%		(4.82%)		14.05%
Total Employer / State Contribution Rate, not less than Normal Cost Rate		21.73%		3.30%		25.03%
Normal Cost Rate by Tier (Total Employer and Me	ember) ²					
Tier 1		15.36%		6.31%		21.67%
Tier 2		14.68%		7.03%		21.71%

¹ Assumes no member contributions from members in the DCR plan, 9.65% contributions for Tier 1 members who elected supplemental coverage, and 8.65% for the remaining members.

² Rates determined considering the payroll for members in each tier. DCR payroll is excluded from these calculations.

Schedule of Past Service Cost Amortizations - Pension (\$'s in 000's)

	Amortiza	tion Period	Bala	ances	
Layer	Date Created			Initial Outstanding	
Initial Amount	6/30/2018	19	\$ 1,720,344	\$ 1,706,391	\$ 129,723
Change in Assumptions	6/30/2018	23	14,346	14,451	978
FY19 Loss	6/30/2019	24	94,314	94,735	6,257
FY20 Loss	6/30/2020	25	44,395	44,395	2,867
Total				\$ 1,859,972	\$ 139,825

Schedule of Past Service Cost Amortizations - Healthcare (\$'s in 000's)

	Amortization Peri			Bala	S		
Layer	Date Created	Years Remaining	Initial		Οι	utstanding	inning-of- r Payment
Initial Amount	6/30/2018	19	\$	(48,285)	\$	(47,894)	\$ (3,641)
Change in Assumptions/Methods/EGWP	6/30/2018	23		(166,274)		(167,496)	(11,335)
FY19 Gain	6/30/2019	24		(213,757)		(214,711)	(14,182)
FY20 Gain	6/30/2020	25		(101,507)		(101,507)	 (6,554)
Total					\$	(531,608)	\$ (35,712)

Schedule of Past Service Cost Amortizations - Total (\$'s in 000's)

	Amortizat	tion Period	Bala		
Layer	Date Created	Years Remaining	Initial	Outstanding	jinning-of- r Payment
Initial Amount	6/30/2018	19	\$ 1,672,059	\$ 1,658,497	\$ 126,082
Change in Assumptions/Methods/EGWP	6/30/2018	23	(151,928)	(153,045)	(10,357)
FY19 Gain	6/30/2019	24	(119,443)	(119,976)	(7,925)
FY20 Gain	6/30/2020	25	(57,112)	(57,112)	 (3,687)
Total				\$ 1,328,364	\$ 104,113

Section 1.3: Roll-Forward Contribution Rate Calculation for FY23 (\$'s in 000's)

	Pension	H	lealthcare	Total
Liability Roll Forward				
a. Actuarial Accrued Liability as of June 30, 2020	\$ 7,447,036	\$	2,489,675	\$ 9,936,711
b. Normal Cost	48,401		23,057	71,458
c. Interest on (a) and (b) at 7.38%	553,163		185,440	738,603
d. Estimated Benefit Payments	(513,035)		(133,002)	(646,037)
e. Interest on (d) at 7.38%, adjusted for timing	 (20,174)		(4,820)	 (24,994)
f. Expected Actuarial Accrued Liability as of June 30, 2021	\$ 7,515,391	\$	2,560,350	\$ 10,075,741
g. Projected Normal Cost	43,895		21,191	65,086
h. Interest on (f) and (g) at 7.38%	557,875		190,518	748,393
i. Estimated Benefit Payments	(531,408)		(139,541)	(670,949)
j. Interest on (i) at 7.38%, adjusted for timing	(20,896)		(5,057)	 (25,953)
k. Expected Actuarial Accrued Liability as of June 30, 2022	\$ 7,564,857	\$	2,627,461	\$ 10,192,318
2. Asset Roll Forward				
a. Actuarial Value of Assets as of June 30, 2020	\$ 5,587,064	\$	3,021,283	\$ 8,608,347
b. Interest on (a) at 7.38%	412,325		222,971	635,296
c. Employee Contributions	33,592		0	33,592
d. Employer Contributions	22,455		25,197	47,652
e. State Assistance Contributions	134,976		0	134,976
f. Interest on (c) thru (e) at 7.38%, adjusted for timing*	11,993		913	12,906
g. Estimated Benefit Payments	(513,035)		(133,002)	(646,037)
h. Administrative Expenses	(3,003)		(1,362)	(4,365)
i. Interest on (g) and (h) at 7.38%, adjusted for timing	(20,282)		(4,870)	(25,152)
j. AVA Adjustments	 (13,377)		(4,007)	 (17,384)
k. Expected Actuarial Value of Assets as of June 30, 2021	\$ 5,652,708	\$	3,127,123	\$ 8,779,831
I. Interest on (k) at 7.38%	417,170		230,782	647,952
m. Employee Contributions	31,234		0	31,234
n. Employer Contributions	24,057		22,264	46,321
o. State Assistance Contributions**	142,665		0	142,665
p. Interest on (m) thru (o) at 7.38%, adjusted for timing*	12,533		807	13,340
q. Estimated Benefit Payments	(531,408)		(139,541)	(670,949)
r. Administrative Expenses	(2,742)		(1,259)	(4,001)
s. Interest on (q) and (r) at 7.38%, adjusted for timing	(20,995)		(5,103)	(26,098)
t. AVA Adjustments	 (60,500)		(29,290)	 (89,790)
u. Expected Actuarial Value of Assets as of June 30, 2022	\$ 5,664,722	\$	3,205,783	\$ 8,870,505
3. Expected Unfunded Actuarial Accrued Liability as of June 30, 2022, 1(k) - 2(u)	\$ 1,900,135	\$	(578,322)	\$ 1,321,813

^{*} Employee and Employer Contributions are paid throughout the year. State Assistance Contributions are assumed to be paid on July 1, 2020 for FY21, and July 1, 2021 for FY22.

^{**} The FY22 State Assistance Contribution is expected to be contributed 100% to pension.

		Pension	i	ealthcare	Total
4. Expected Annual Rate Payroll for FY23					
a. Defined Benefit Members					\$ 291,514
b. Defined Contribution Retirement Members					463,287
c. Total Rate Payroll					\$ 754,801
5. Expected FY23 Contribution Rate Calculation					
a. Projected Normal Cost for FY23	\$	42,117	\$	20,540	\$ 62,657
b. Projected Normal Cost Rate for FY23		5.58%		2.72%	8.30%
c. Expected Member Contribution Rate for FY23		(3.34%)		0.00%	(3.34%)
d. Expected Employer Normal Cost Rate for FY23		2.24%		2.72%	4.96%
e. Expected Unfunded Liability as of June 30, 2022	\$	1,900,135	\$	(578,322)	\$ 1,321,813
f. FY23 Layered Amortization of Expected Unfunded Liabili	ty	152,229		(40,720)	111,509
g. Expected Past Service Cost Contribution Rate for FY	′23	20.17%		(5.39%)	20.17%
h. Expected Total Contribution Rate for FY23, not less than Normal Cost Rate		22.41%		2.72%	25.13%

The components of the expected FY23 amortization amounts are shown below (totals may not add due to rounding):

Expected FY23 Schedule of Past Service Cost Amortizations - Pension (\$'s in 000's)

	Amortization Period		Balances					
Layer	Date Created	Years Remaining at 6/30/22	Initial		utstanding at 6/30/22		Year	nning-of- Payment FY23
Initial Amount	6/30/2018	17	\$ 1,720,344	\$	1,674,843	\$;	136,956
Change in Assumptions	6/30/2018	21	14,346		14,455			1,032
FY19 Loss	6/30/2019	22	94,314		95,115			6,606
FY20 Loss	6/30/2020	23	44,395		44,722			3,027
Expected FY21 Loss	6/30/2021	24	15,589		15,658			1,034
Expected FY22 Loss	6/30/2022	25	55,342		55,342	_		3,574
Total				\$	1,900,135	\$;	152,229

Expected FY23 Schedule of Past Service Cost Amortizations - Healthcare (\$'s in 000's)

	Amortization Period		Balances				
Layer	Date Created	Years Remaining at 6/30/22	Initial		itstanding it 6/30/22	Yea	ginning-of- ir Payment or FY23
Initial Amount	6/30/2018	17	\$ (48,285)	\$	(47,009)	\$	(3,844)
Change in Assumptions/Methods/EGWP	6/30/2018	21	(166,274)		(167,555)		(11,967)
FY19 Gain	6/30/2019	22	(213,757)		(215,572)		(14,973)
FY20 Gain	6/30/2020	23	(101,507)		(102,254)		(6,920)
Expected FY21 Gain	6/30/2021	24	(34,281)		(34,434)		(2,274)
Expected FY22 Gain	6/30/2022	25	(11,498)		(11,498)		(742)
Total				\$	(578,322)	\$	(40,720)

Expected FY23 Schedule of Past Service Cost Amortizations - Total (\$'s in 000's)

	Amortization Period		Balances			
Layer	Date Created	Years Remaining at 6/30/22	Initial		utstanding at 6/30/22	eginning-of- ear Payment for FY23
Initial Amount	6/30/2018	17	\$ 1,672,059	\$	1,627,834	\$ 133,112
Change in Assumptions/Methods/EGWP	6/30/2018	21	(151,928)		(153,100)	(10,935)
FY19 Gain	6/30/2019	22	(119,443)		(120,457)	(8,367)
FY20 Gain	6/30/2020	23	(57,112)		(57,532)	(3,893)
Expected FY21 Gain	6/30/2021	24	(18,692)		(18,776)	(1,240)
Expected FY22 Loss	6/30/2022	25	43,844	_	43,844	 2,832
Total				\$	1,321,813	\$ 111,509

Section 1.4: Actuarial Gain/(Loss) for FY20 (\$'s in 000's)

	Pension	ŀ	lealthcare	Total
1. Expected Actuarial Accrued Liability				
a. Actuarial Accrued Liability as of June 30, 2019	\$ 7,388,020	\$	2,518,644	\$ 9,906,664
b. Normal Cost	50,654		24,458	75,112
c. Interest on (a) and (b) at 7.38%	548,974		187,681	736,655
d. Employer Group Waiver Plan	0		11,705	11,705
e. Benefit Payments	(488,748)		(125,310)	(614,058)
f. Refund of Contributions	(1,699)		0	(1,699)
g. Interest on (d) thru (f) at 7.38%, adjusted for timing	(19,285)		(4,117)	(23,402)
h. Assumptions/Methods Changes	 0		0	0
i. Expected Actuarial Accrued Liability as of June 30, 2020 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	\$ 7,477,916	\$	2,613,061	\$ 10,090,977
2. Actual Actuarial Accrued Liability as of June 30, 2020	7,447,036		2,489,675	 9,936,711
3. Liability Gain/(Loss), (1)(i) - (2)	\$ 30,880	\$	123,386	\$ 154,266
4. Expected Actuarial Asset Value				
a. Actuarial Value of Assets as of June 30, 2019	\$ 5,563,931	\$	2,947,562	\$ 8,511,493
b. Interest on (a) at 7.38%	410,618		217,530	628,148
c. Employee Contributions	33,566		0	33,566
d. Employer Contributions	33,204		18,788	51,992
e. State Assistance Contributions	141,129		0	141,129
f. Employer Group Waiver Plan	0		11,705	11,705
g. Interest on (c) thru (f) at 7.38%, adjusted for timing	12,835		1,105	13,940
h. Benefit Payments	(488,748)		(125,310)	(614,058)
i. Refund of Contributions	(1,699)		0	(1,699)
j. Administrative Expenses	(2,988)		(1,372)	(4,360)
k. Interest on (h) thru (j) at 7.38%, adjusted for timing	 (19,394)		(4,591)	 (23,985)
I. Expected Actuarial Asset Value as of June 30, 2020 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h) + (i) + (j) + (k)	\$ 5,682,454	\$	3,065,417	\$ 8,747,871
5. Actual Actuarial Asset Value as of June 30, 2020	 5,587,064		3,021,283	 8,608,347
6. Actuarial Asset Value Gain/(Loss), (5) - (4)(I)	\$ (95,390)	\$	(44,134)	\$ (139,524)
7. Total Actuarial Gain/(Loss), (3) + (6)	\$ (64,510)	\$	79,252	\$ 14,742
8. Contribution Gain/(Loss)	\$ 19,953	\$	22,132	\$ 42,085
9. Administrative Expense Gain/(Loss)	\$ 162	\$	123	\$ 285
10. FY20 Gain/(Loss), (7) + (8) + (9)	\$ (44,395)	\$	101,507	\$ 57,112

Section 1.5: Development of Change in Unfunded Liability During FY20 (\$'s in 000's)

	Pension	Н	ealthcare	Total
1. 2019 Unfunded Liability	\$ 1,824,089	\$	(428,918)	\$ 1,395,171
a. Interest on Unfunded Liability at 7.38%	\$ 134,618	\$	(31,654)	\$ 102,964
b. Normal Cost	50,654		24,458	75,112
c. Employee Contributions	(33,566)		0	(33,566)
d. Employer Contributions	(33,204)		(18,788)	(51,992)
e. State Assistance Contributions	(141,129)		0	(141,129)
f. Administrative Expenses	2,988		1,372	4,360
g. Interest on (b) thru (f) at 7.38%, adjusted for timing	(8,988)		1,174	(7,814)
h. Assumptions/Methods Changes	 0		0	 0
i. Expected Change in Unfunded Liability During FY20(a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	\$ (28,627)	\$	(23,438)	\$ (52,065)
2. Expected 2020 Unfunded Liability, (1) + (1)(i)	\$ 1,795,462	\$	(452,356)	\$ 1,343,106
a. Liability (Gain)/Loss During FY20	\$ (30,880)	\$	(123,386)	\$ (154,266)
b. Actuarial Assets (Gain)/Loss During FY20	 95,390		44,134	139,524
c. Total Actuarial (Gain)/Loss During FY20	\$ 64,510	\$	(79,252)	\$ (14,742)
3. Actual 2020 Unfunded Liability, (2) + (2)(c)	\$ 1,859,972	\$	(531,608)	\$ 1,328,364

Section 1.6: Analysis of Financial Experience

Pension
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience

	Cha	nge in Employer / S	State Contribution	Rate During Fiscal	Year
			Pension		
Type of (Gain) or Loss	2016	2017	2018	2019	2020
1. Health Claims	N/A	N/A	N/A	N/A	N/A
2. Salary Experience	(0.29%)	(0.34%)	(0.39%)	(0.06%)	(0.06%)
3. Investment Experience	1.29%	1.12%	0.91%	0.93%	0.83%
4. Demographic Experience and Miscellaneous	0.02%	(0.47%)	0.37%	0.75%	(0.28%)
5. Actual vs Expected Contributions	0.04%	(0.07%)	<u>(0.03%)</u>	<u>(0.15%)</u>	<u>(0.17%)</u>
 (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5) 	1.06%	0.24%	0.86%	1.47%	0.32%
7. Assumptions / Method Changes	1.42%	0.00%	(0.32%)	0.00%	0.00%
8. System Benefit Changes	0.00%	0.00%	0.00%	0.00%	0.00%
 Composite (Gain) or Loss During Year, (6) + (7) + (8) 	2.48%	0.24%	0.54%	1.47%	0.32%
10. Beginning Total Employer / State Contribution Rate	16.68%	<u>19.16%</u>	<u>19.40%</u>	19.94%	21.41%
 Ending Valuation Year Employer / State Contribution Rate, (9) + (10) 	19.16%	19.40%	19.94%	21.41%	21.73%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	20.86%	20.71%	20.94%	22.51%	22.41% *
b. Fiscal Year for which Rate Applies	FY19	FY20	FY21	FY22	FY23

^{*} Expected rate. Actual rate to be determined

Healthcare
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Cha	nge in Employer / S	State Contribution	Rate During Fiscal	Year
			Healthcare		
Type of (Gain) or Loss	2016	2017	2018	2019	2020
1. Health Claims ¹	0.00%	(2.32%)	(1.58%)	(2.51%)	(0.95%)
2. Salary Experience	N/A	N/A	N/A	N/A	N/A
3. Investment Experience	0.67%	0.56%	0.45%	0.45%	0.38%
4. Demographic Experience and Miscellaneous	0.00%	(0.71%)	1.49%	1.60%	0.49%
5. Actual vs Expected Contributions	(0.50%)	<u>(0.11%)</u>	0.05%	<u>(0.02%)</u>	<u>(0.19%)</u>
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	0.17%	(2.58%)	0.41%	(0.48%)	(0.27%)
7. Assumptions / Method Changes	0.24%	3.41%	0.24%	0.00%	0.00%
8. System Benefit Changes	0.00%	0.00%	0.00%	0.00%	0.00%
 Composite (Gain) or Loss During Year, (6) + (7) + (8) 	0.41%	0.83%	0.65%	(0.48%)	(0.27%)
10. Beginning Total Employer / State Contribution Rate	2.16%	2.57%	3.40%	4.05%	3.57%
 Ending Valuation Year Employer / State Contribution Rate, (9) + (10) 	2.57%	3.40%	4.05%	3.57%	3.30%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	2.70%	3.91%	3.40%	2.98%	2.72% *
b. Fiscal Year for which Rate Applies	FY19	FY20	FY21	FY22	FY23

^{*} Expected rate. Actual rate to be determined

¹ The 2016 health claims percentage includes the effect of healthcare demographic experience gain/loss

Total
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Change in Employer / State Contribution Rate During Fiscal Year						
			Total				
Type of (Gain) or Loss	2016	2017	2018	2019	2020		
1. Health Claims ¹	0.00%	(2.32%)	(1.58%)	(2.51%)	(0.95%)		
2. Salary Experience	(0.29%)	(0.34%)	(0.39%)	(0.06%)	(0.06%)		
3. Investment Experience	1.96%	1.68%	1.36%	1.38%	1.21%		
4. Demographic Experience and Miscellaneous	0.02%	(1.18%)	1.86%	2.35%	0.21%		
5. Actual vs Expected Contributions	(0.46%)	<u>(0.18%)</u>	0.02%	<u>(0.17%)</u>	<u>(0.36%)</u>		
 (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5) 	1.23%	(2.34%)	1.27%	0.99%	0.05%		
7. Assumptions / Method Changes	1.66%	3.41%	(0.08%)	0.00%	0.00%		
8. System Benefit Changes	0.00%	0.00%	0.00%	0.00%	0.00%		
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	2.89%	1.07%	1.19%	0.99%	0.05%		
10. Beginning Total Employer / State Contribution Rate	18.84%	21.73%	22.80%	23.99%	24.98%		
 Ending Valuation Year Employer / State Contribution Rate, (9) + (10) 	21.73%	22.80%	23.99%	24.98%	25.03%		
12. Fiscal Year Rates Adopted by ARMB							
a. Fiscal Year Employer / State Contribution Rate	23.56%	24.62%	24.34%	25.49%	25.13% *		
b. Fiscal Year for which Rate Applies	FY19	FY20	FY21	FY22	FY23		

^{*} Expected rate. Actual rate to be determined

¹ The 2016 health claims percentage includes the effect of healthcare demographic experience gain/loss

Section 1.7: History of Unfunded Liability and Funded Ratio (\$'s in 000's)

Valuation Date	Total Actuarial Accrued Liability	Valuation Assets	Assets as a Percent of Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability (UAAL)
June 30, 2003	\$ 5,835,609	\$ 3,752,285	64.3%	\$ 2,083,324
June 30, 2004	6,123,600	3,845,370	62.8%	2,278,230
June 30, 2005	6,498,556	3,958,939	60.9%	2,539,617
June 30, 2006	7,229,851	4,141,700	57.3%	3,088,151
June 30, 2007	7,189,403	4,424,399	61.5%	2,765,004
June 30, 2008	7,619,178	4,936,976	64.8%	2,682,202
June 30, 2009	7,847,514	4,472,958	57.0%	3,374,556
June 30, 2010	8,847,788	4,739,128	53.6%	4,108,660
June 30, 2011	9,128,795	4,937,937	54.1%	4,190,858
June 30, 2012	9,346,444	4,869,154	52.1%	4,477,290
June 30, 2013	9,592,107	4,974,076	51.9%	4,618,031
June 30, 2014	9,841,032	6,019,274	61.2%	3,821,758
June 30, 2015	9,729,117	8,108,923	83.3%	1,620,194
June 30, 2016	9,907,624	8,200,391	82.8%	1,707,233
June 30, 2017	10,144,618	8,313,637	82.0%	1,830,981
June 30, 2018	9,960,440	8,440,309	84.7%	1,520,131
June 30, 2019	9,906,664	8,511,493	85.9%	1,395,171
June 30, 2020	9,936,711	8,608,347	86.6%	1,328,364

Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets (\$'s in 000's)

As of June 30, 2020	Pension	ŀ	lealthcare	Total	Allocation Percent
Cash and Short-Term Investments					
- Cash and Cash Equivalents	\$ 55,802	\$	28,691	\$ 84,493	1.0%
- Subtotal	\$ 55,802	\$	28,691	\$ 84,493	1.0%
Fixed Income Investments					
- Domestic Fixed Income Pool	\$ 1,178,804	\$	642,460	\$ 1,821,264	21.6%
- International Fixed Income Pool	0		0	0	0.0%
- Tactical Fixed Income Pool	0		0	0	0.0%
- High Yield Pool	0		0	0	0.0%
- Treasury Inflation Protection Pool	0		0	0	0.0%
- Emerging Debt Pool	0		0	0	0.0%
- Subtotal	\$ 1,178,804	\$	642,460	\$ 1,821,264	21.6%
Equity Investments					
- Domestic Equity Pool	\$ 1,484,807	\$	809,287	\$ 2,294,094	27.3%
- International Equity Pool	847,228		461,777	1,309,005	15.6%
- Private Equity Pool	671,858		366,193	1,038,051	12.3%
- Emerging Markets Equity Pool	177,165		96,563	273,728	3.3%
- Alternative Equity Strategies	295,547		161,087	 456,634	5.4%
- Subtotal	\$ 3,476,605	\$	1,894,907	\$ 5,371,512	63.9%
Other Investments					
- Real Estate Pool	\$ 334,427	\$	182,651	\$ 517,078	6.1%
- Other Investments Pool	400,371		218,220	618,591	7.4%
- Absolute Return Pool	0		0	0	0.0%
- Other Assets	0		318	 318	0.0%
- Subtotal	\$ 734,798	\$	401,189	\$ 1,135,987	13.5%
Total Cash and Investments	\$ 5,446,009	\$	2,967,247	\$ 8,413,256	100.0%
Net Accrued Receivables	 (1,210)		(13,786)	 (14,996)	
Net Assets	\$ 5,444,799	\$	2,953,461	\$ 8,398,260	

Section 2.2: Changes in Fair Value of Assets During FY20 (\$'s in 000's)

Fiscal Year 2020	Pension	Н	lealthcare	Total
1. Fair Value of Assets as of June 30, 2019	\$ 5,511,929	\$	2,929,319	\$ 8,441,248
2. Additions:				
a. Employee Contributions	\$ 33,566	\$	0	\$ 33,566
b. Employer Contributions	33,204		18,788	51,992
c. State Assistance Contributions	141,129		0	141,129
d. Interest and Dividend Income	83,965		44,835	128,800
e. Net Appreciation / Depreciation in Fair Value of Investments	150,651		83,644	234,295
f. Employer Group Waiver Plan	0		11,705	11,705
g. Other	 33		258	291
h. Total Additions	\$ 442,548	\$	159,230	\$ 601,778
3. Deductions:				
a. Medical Benefits	\$ 0	\$	125,310	\$ 125,310
b. Retirement Benefits	488,748		0	488,748
c. Refund of Contributions	1,699		0	1,699
d. Investment Expenses	16,243		8,406	24,649
e. Administrative Expenses	 2,988		1,372	4,360
f. Total Deductions	\$ 509,678	\$	135,088	\$ 644,766
4. Fair Value of Assets as of June 30, 2020	\$ 5,444,799	\$	2,953,461	\$ 8,398,260
Approximate Fair Value Investment Return Rate during FY20 Net of Investment Expenses	4.1%		4.2%	4.1%

Section 2.3: Development of Actuarial Value of Assets (\$'s in 000's)

The actuarial value of asset was set equal to the fair value as of June 30, 2014 and the 20% corridor was eliminated. Investment gains and losses after June 30, 2014 are recognized 20% per year over 5 years.

	Pension	Н	lealthcare	Total
1. Deferral of Investment Gain / (Loss) for FY20				
a. Fair Value of Assets as of June 30, 2019	\$ 5,511,929	\$	2,929,319	\$ 8,441,248
b. Contributions	207,899		18,788	226,687
c. Employer Group Waiver Plan	0		11,705	11,705
d. Benefit Payments	490,447		125,310	615,757
e. Administrative Expenses	2,988		1,372	4,360
f. Actual Investment Return (net of investment expenses)	218,406		120,331	338,737
g. Expected Return Rate (net of investment expenses)	7.38%		7.38%	7.38%
h. Expected Return, Weighted for Timing	400,222		212,698	612,920
i. Investment Gain / (Loss) for the Year, (f) - (h)	(181,816)		(92,367)	(274,183)
2. Actuarial Value as of June 30, 2020				
a. Fair Value as of June 30, 2020	\$ 5,444,799	\$	2,953,461	\$ 8,398,260
b. Deferred Investment Gain / (Loss)	(142,265)		(67,822)	(210,087)
c. Actuarial Value as of June 30, 2020, (a) - (b)	5,587,064		3,021,283	8,608,347
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	102.6%		102.3%	102.5%
Approximate Actuarial Value Investment Return Rate during FY20 Net of Investment Expenses	5.7%		5.9%	5.8%

The tables below show the development of the gains/(losses) to be recognized in the current year (\$'s in 000's):

		Pension		
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Gain / (Loss) Recognized Recognized in Prior Years This Year		Gain / (Loss) Deferred to Future Years
June 30, 2016	\$ (443,393)	\$ (354,716)	\$ (88,677)	\$ 0
June 30, 2017	236,679	142,008	47,336	47,335
June 30, 2018	13,001	5,200	2,600	5,201
June 30, 2019	(82,246)	(16,449)	(16,449)	(49,348)
June 30, 2020	(181,816)	0	(36,363)	(145,453)
Total	\$ (457,775)	\$ (223,957)	\$ (91,553)	\$ (142,265)

	Healthcare												
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years									
June 30, 2016	\$ (218,931)	\$ (175,144)	\$ (43,787)	\$ 0									
June 30, 2017	126,053	75,633	25,210	25,210									
June 30, 2018	9,619	3,848	1,924	3,847									
June 30, 2019	(38,309)	(7,662)	(7,662)	(22,985)									
June 30, 2020	(92,367)	0	(18,473)	(73,894)									
Total	\$ (213,935)	\$ (103,325)	\$ (42,788)	\$ (67,822)									

	Total												
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years									
June 30, 2016	\$ (662,324)	\$ (529,860)	\$ (132,464)	\$ 0									
June 30, 2017	362,732	217,641	72,546	72,545									
June 30, 2018	22,620	9,048	4,524	9,048									
June 30, 2019	(120,555)	(24,111)	(24,111)	(72,333)									
June 30, 2020	(274,183)	0	(54,836)	(219,347)									
Total	\$ (671,710)	\$ (327,282)	\$ (134,341)	\$ (210,087)									

Section 2.4: Historical Asset Rates of Return

	Actual	rial Value	Fair	air Value		
Year Ending	Annual	Cumulative*	Annual	Cumulative*		
June 30, 2005	9.1%	9.1%	8.5%	8.5%		
June 30, 2006	9.6%	9.3%	11.4%	9.9%		
June 30, 2007	11.9%	10.2%	18.5%	12.7%		
June 30, 2008	10.2%	10.2%	(3.0%)	8.6%		
June 30, 2009	(7.9%)	6.3%	(21.0%)	1.9%		
June 30, 2010	8.1%	6.6%	10.6%	3.3%		
June 30, 2011	6.9%	6.6%	20.5%	5.6%		
June 30, 2012	0.7%	5.9%	0.2%	4.9%		
June 30, 2013	3.7%	5.6%	12.2%	5.7%		
June 30, 2014	22.7%	7.2%	18.2%	6.9%		
June 30, 2015	7.2%	7.2%	3.2%	6.5%		
June 30, 2016	5.1%	7.1%	(0.7%)	5.9%		
June 30, 2017	5.6%	6.9%	12.9%	6.4%		
June 30, 2018	6.2%	6.9%	8.2%	6.6%		
June 30, 2019	5.5%	6.8%	5.9%	6.5%		
June 30, 2020	5.8%	6.7%	4.1%	6.4%		

^{*} Cumulative since fiscal year ending June 30, 2005

Section 3: Projections

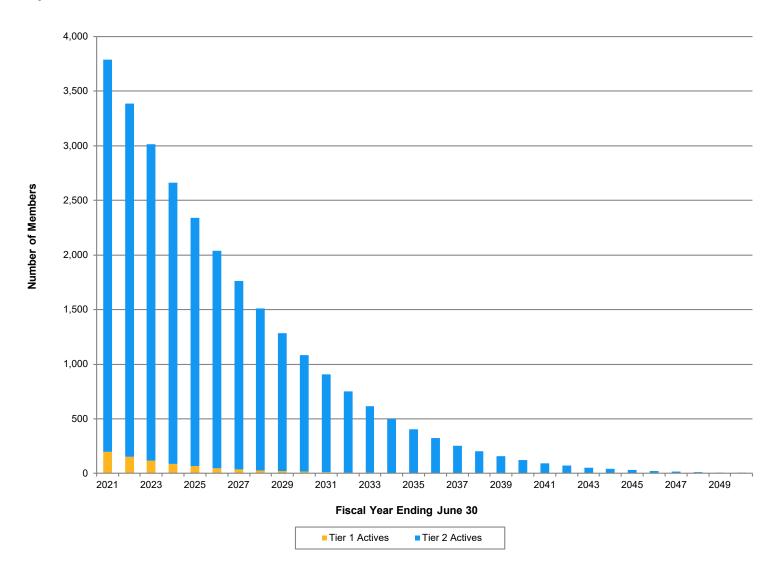
Section 3.1: Projection Assumptions and Methods

Key Assumptions

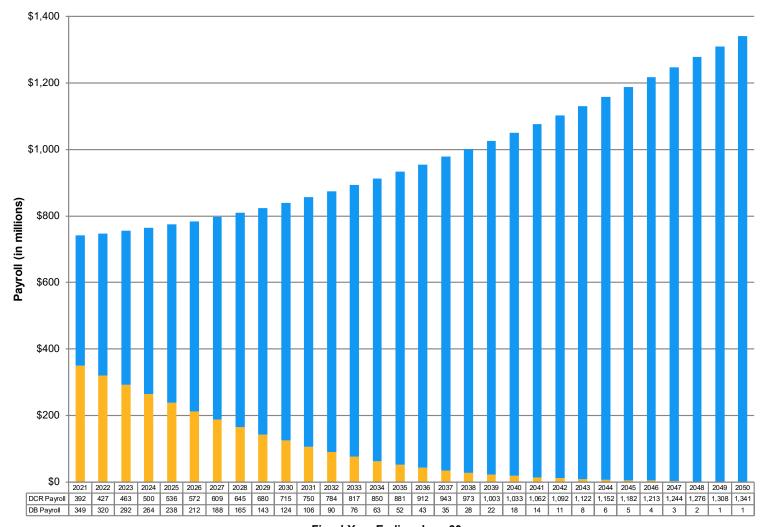
- 7.38% investment return (net of investment expenses) on the Fair Value of Assets in all future years.
- The Actuarial Value of Assets was re-initialized to Fair Value as of June 30, 2014. The Actuarial Value of Assets after June 30, 2014 reflects the deferred gains and losses generated by the smoothing method. The current deferred amount is recognized in the first four years of the projections.
- Actuarial assumptions and methods as described in Section 5. No actuarial gains/losses are assumed after June 30, 2020.
- The actuarially calculated contribution rate using a two-year roll-forward approach is adopted each year.
- Projections assume a 0% increase in the total active member population. All new members are expected to enter the DCR plan.
- Contribution rates are determined as a percent of total DB and DCR payroll.
- The DCR contribution rate determined as of June 30, 2020 is assumed to remain constant in all future years.
- The active rehire assumption shown in Section 5 is assumed to grade to zero on a uniform basis over 20 years.
- The Normal Cost is increased by the administrative expenses shown in Section 5. For future years, the percent increase is assumed to remain constant.

Section 3.2: Membership Projection

Projected Active Member Count



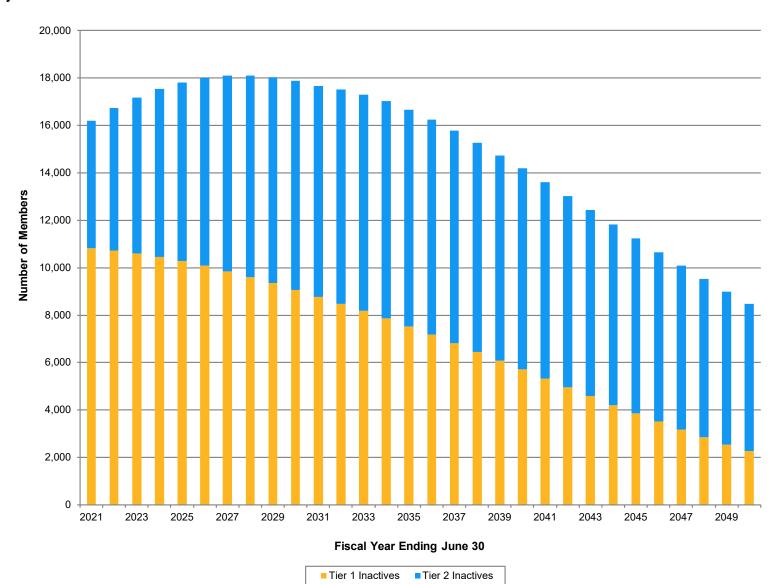
Projected DB and DCR Payroll

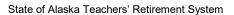


Fiscal Year Ending June 30

■ DB Payroll ■ DCR Payroll

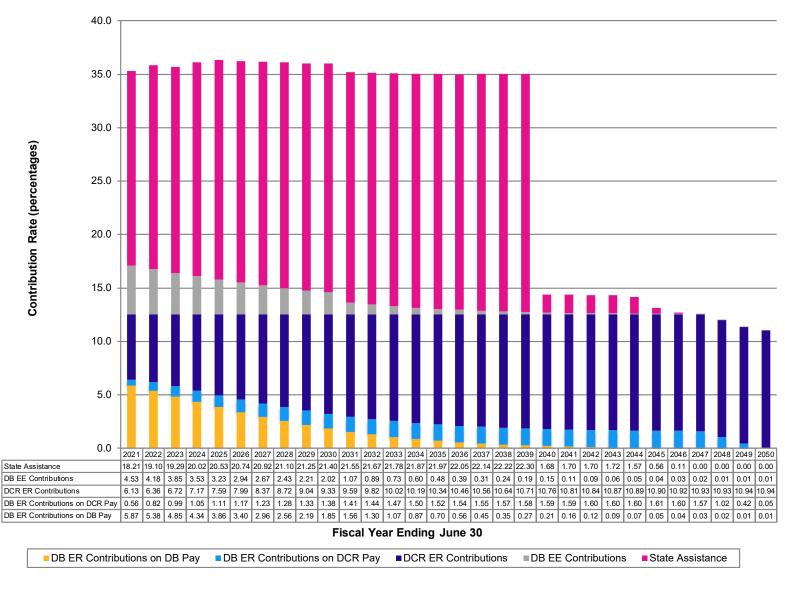
Projected Inactive Member Count



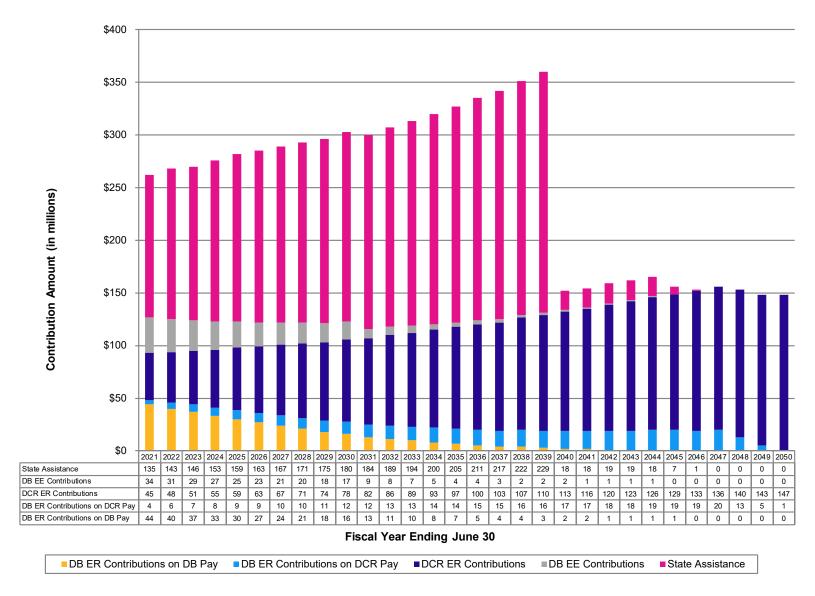


Section 3.3: Projected Employer/State Contribution Rates

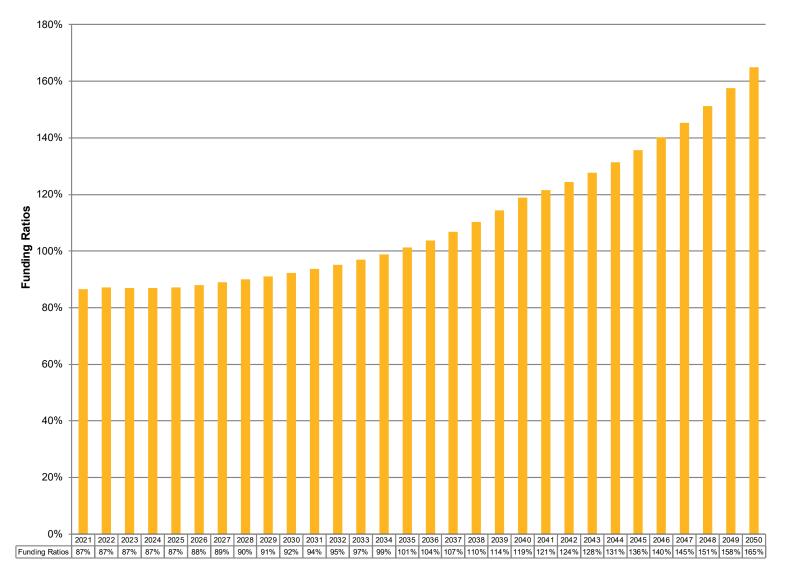
Based on Total DB and DCR Payroll



Section 3.4: Projected Employer/State Contribution Amounts



Section 3.5: Projection of Funded Ratios



Fiscal Year Ending June 30

Section 3.6: Table of Projected Actuarial Results (\$'s in 000's)

	Valuation A	mounts on Ju	ıly 1 (Begin	ning of FY)	Cash Flow Amounts during Following 12 Months									
Fiscal				Unfunded		Con	tribution Ra	ites		DB Cont	ributions			Deferred Asset
Year End	Actuarial Assets	Accrued Liability	Funding Ratio	Liability / (Surplus)	Total Salaries	Employer / State	DCR	Total	Employer	State Assistance	Employee	Total	Benefit Payments	Gain / (Loss)
2021	\$ 8,608,347	\$ 9,936,711	86.6%	\$ 1,328,364	\$ 741,090	24.64%	6.13%	30.77%	\$ 47,652	\$ 134,976	\$ 33,592	\$ 216,220	\$ 646,037	\$ (208,208)
2022	8,779,831	10,075,741	87.1%	1,295,910	747,110	25.30%	6.36%	31.66%	46,321	142,665	31,234	220,220	670,949	(133,785)
2023	8,870,505	10,192,318	87.0%	1,321,813	754,801	25.13%	6.72%	31.85%	44,081	145,601	29,053	218,735	695,571	(54,836)
2024	8,942,204	10,285,931	86.9%	1,343,727	763,529	25.41%	7.17%	32.58%	41,154	152,859	26,942	220,955	719,738	0
2025	9,026,969	10,355,543	87.2%	1,328,574	773,564	25.50%	7.59%	33.09%	38,446	158,813	24,976	222,235	743,225	0
2026	9,154,375	10,400,684	88.0%	1,246,309	784,447	25.31%	7.99%	33.30%	35,849	162,694	23,063	221,606	765,802	0
2027	9,267,565	10,420,496	88.9%	1,152,931	796,246	25.11%	8.37%	33.48%	33,363	166,575	21,280	221,218	786,528	0
2028	9,367,651	10,415,007	89.9%	1,047,356	809,317	24.94%	8.72%	33.66%	31,078	170,766	19,633	221,477	807,659	0
2029	9,453,909	10,383,059	91.1%	929,150	823,680	24.77%	9.04%	33.81%	28,994	175,032	18,205	222,231	828,000	0
2030	9,526,639	10,323,558	92.3%	796,919	839,114	24.63%	9.33%	33.96%	27,104	179,570	16,911	223,585	845,827	0
2031	9,588,062	10,237,634	93.7%	649,572	855,678	24.52%	9.59%	34.11%	25,414	184,399	9,156	218,969	855,379	0
2032	9,639,746	10,126,104	95.2%	486,358	873,703	24.41%	9.82%	34.23%	23,940	189,331	7,776	221,047	868,879	0
2033	9,683,787	9,989,195	96.9%	305,408	892,690	24.32%	10.02%	34.34%	22,674	194,428	6,517	223,619	880,356	0
2034	9,722,219	9,827,327	98.9%	105,108	912,623	24.24%	10.19%	34.43%	21,629	199,591	5,476	226,696	887,930	0
2035	9,759,186	9,642,988	101.2%	(116,198)	933,432	24.19%	10.34%	34.53%	20,722	205,075	4,480	230,277	891,475	0
2036	9,799,269	9,439,034	103.8%	(360,235)	955,229	24.15%	10.46%	34.61%	20,060	210,628	3,725	234,413	892,002	0
2037	9,846,391	9,217,513	106.8%	(628,878)	977,938	24.14%	10.56%	34.70%	19,559	216,515	3,032	239,106	889,967	0
2038	9,904,304	8,980,095	110.3%	(924,209)	1,001,236	24.14%	10.64%	34.78%	19,223	222,475	2,403	244,101	884,543	0
2039	9,977,621	8,729,379	114.3%	(1,248,242)	1,025,467	24.15%	10.71%	34.86%	18,971	228,679	1,948	249,598	877,047	0
2040	10,070,146	8,466,760	118.9%	(1,603,386)	1,050,536	3.48%	10.76%	14.24%	18,910	17,649	1,576	38,135	868,022	0
2041	9,951,890	8,193,155	121.5%	(1,758,735)	1,076,449	3.45%	10.81%	14.26%	18,838	18,300	1,184	38,322	854,528	0
2042	9,839,195	7,912,579	124.3%	(1,926,616)	1,103,194	3.42%	10.84%	14.26%	18,975	18,754	993	38,722	838,425	0
2043	9,735,384	7,627,387	127.6%	(2,107,997)	1,130,493	3.41%	10.87%	14.28%	19,105	19,444	678	39,227	817,877	0
2044	9,645,832	7,341,960	131.4%	(2,303,872)	1,158,574	3.24%	10.89%	14.13%	19,348	18,190	579	38,117	795,721	0
2045	9,571,508	7,058,062	135.6%	(2,513,446)	1,187,306	2.22%	10.90%	13.12%	19,709	6,649	475	26,833	771,176	0
2046	9,505,081	6,778,372	140.2%	(2,726,709)	1,216,772	1.75%	10.92%	12.67%	19,955	1,338	365	21,658	747,071	0
2047	9,453,239	6,502,821	145.4%	(2,950,418)	1,246,928	1.60%	10.93%	12.53%	19,950	0	249	20,199	722,987	0
2048	9,421,036	6,231,752	151.2%	(3,189,284)	1,277,634	1.04%	10.93%	11.97%	13,288	0	128	13,416	700,041	0
2049	9,403,275	5,964,366	157.7%	(3,438,909)	1,309,219	0.43%	10.94%	11.37%	5,630	0	131	5,761	677,034	0
2050	9,400,178	5,701,037	164.9%	(3,699,141)	1,341,582	0.06%	10.94%	11.00%	805	0	134	939	654,179	0
								Total	\$ 740.747	\$ 3.540.996	\$ 295.894	\$ 4,577,637		

The FY21 and FY22 Employer/State contribution rates shown above differ from those shown in Section 1.6 because they are adjusted for total salaries.

Section 3.6: Table of Projected Actuarial Results (\$'s in 000's) (continued)

		Valuation	Amounts	on July 1 (Begi	nning of EV)						
		Valuation	Amounts	T Consult (Begi							
Fiscal		Funding Ratio		Unfunded Liability / (Surplus)							
Year											
End	Pension	Healthcare	Total	Pension	Healthcare	Total					
2021	75.0%	121.4%	86.6%	\$ 1,859,972	\$ (531,608)	\$ 1,328,364					
2022	75.2%	122.1%	87.1%	1,862,683	(566,773)	1,295,910					
2023	74.9%	122.0%	87.0%	1,900,135	(578,322)	1,321,813					
2024	74.5%	122.2%	86.9%	1,939,040	(595,313)	1,343,727					
2025	74.4%	122.6%	87.2%	1,948,739	(620,165)	1,328,574					
2026	74.9%	123.9%	88.0%	1,912,850	(666,541)	1,246,309					
2027	75.4%	125.3%	88.9%	1,869,425	(716,494)	1,152,931					
2028	75.9%	126.8%	89.9%	1,817,840	(770,484)	1,047,356					
2029	76.5%	128.5%	91.1%	1,757,393	(828,243)	929,150					
2030	77.2%	130.4%	92.3%	1,687,324	(890,405)	796,919					
2031	78.0%	132.6%	93.7%	1,606,772	(957,200)	649,572					
2032	78.9%	135.0%	95.2%	1,514,666	(1,028,308)	486,358					
2033	80.0%	137.6%	96.9%	1,409,757	(1,104,349)	305,408					
2034	81.3%	140.6%	98.9%	1,290,885	(1,185,777)	105,108					
2035	82.9%	144.0%	101.2%	1,156,997	(1,273,195)	(116,198)					
2036	84.7%	147.8%	103.8%	1,006,797	(1,367,032)	(360,235)					
2037	86.9%	152.0%	106.8%	838,914	(1,467,792)	(628,878)					
2038	89.5%	156.8%	110.3%	651,848	(1,576,057)	(924,209)					
2039	92.6%	162.1%	114.3%	444,021	(1,692,263)	(1,248,242)					
2040	96.3%	168.1%	118.9%	213,723	(1,817,109)	(1,603,386)					
2041	96.6%	174.9%	121.5%	192,406	(1,951,141)	(1,758,735)					
2042	96.9%	182.5%	124.3%	168,433	(2,095,049)	(1,926,616)					
2043	97.3%	191.1%	127.6%	141,613	(2,249,610)	(2,107,997)					
2044	97.7%	200.6%	131.4%	111,684	(2,415,556)	(2,303,872)					
2045	98.3%	211.1%	135.6%	80,348	(2,593,794)	(2,513,446)					
2046	98.7%	222.7%	140.2%	58,488	(2,785,197)	(2,726,709)					
2047	99.1%	235.5%	145.4%	40,285	(2,990,703)	(2,950,418)					
2048	99.5%	249.7%	151.2%	22,170	(3,211,454)	(3,189,284)					
2049	99.8%	265.7%	157.7%	9,521	(3,448,430)	(3,438,909)					
2050	99.9%	283.5%	164.9%	3,801	(3,702,942)	(3,699,141)					

Section 3.7: Projected Pension Benefit Recipients and Amounts (\$'s in 000's)

	Per	nsion		Per	nsion
Fiscal Year End	Recipient Counts	Benefit Amounts	Fiscal Year End	Recipient Counts	Benefit Amounts
2021	13,689	\$ 513,035	2060	3,590	\$ 275,43
2022	14,250	531,408	2061	3,283	258,13
2023	14,749	549,041	2062	2,993	241,24
2024	15,196	565,575	2063	2,718	224,77
2025	15,576	581,240	2064	2,460	208,73
2026	15,889	595,794	2065	2,217	193,17
2027	16,138	609,418	2066	1,989	178,10
2028	16,317	621,862	2067	1,774	163,56
2029	16,425	632,713	2068	1,575	149,57
2030	16,449	641,870	2069	1,389	136,18
2031	16,411	642,603	2070	1,218	123,40
2032	16,280	647,688	2071	1,060	111,28
2033	16,090	650,746	2072	916	99,85
2034	15,826	651,691	2073	785	89,13
2035	15,492	650,489	2074	667	79,12
2036	15,094	647,316	2075	561	69,85
2037	14,665	642,181	2076	467	61,29
2038	14,173	635,419	2077	386	53,45
2039	13,672	626,629	2078	314	46,30
2040	13,153	616,155	2079	253	39,83
2041	12,603	604,106	2080	202	34,01
2042	12,043	590,528	2081	158	28,83
2043	11,468	575,528	2082	123	24,24
2044	10,889	559,397	2083	94	20,18
2045	10,316	542,226	2084	70	16,62
2046	9,754	524,227	2085	52	13,50
2047	9,205	505,557	2086	38	10,81
2048	8,673	486,343	2087	27	8,52
2049	8,158	466,729	2088	19	6,59
2050	7,659	446,876	2089	13	4,99
2051	7,172	445,248	2090	9	3,69
2052	6,701	425,558	2091	6	2,66
2053	6,248	405,947	2092	4	1,86
2054	5,812	386,484	2093	2	1,26
2055	5,395	367,231	2094	2	82
2056	4,997	348,233	2095	1	52
2057	4,617	329,529	2096	1	31
2058	4,257	311,146	2097	1	18
2059	3,914	293,108	2098	0	

Counts include retirees, disabilitants, and beneficiaries.

Section 4: Member Data

Section 4.1: Summary of Members Included

As of June 30		2016		2017		2018		2019	2020
Active Members									
1. Number		5,123		4,772		4,418		4,044	3,789 ¹
2. Average Age		50.50		50.86		51.13		51.48	51.92
3. Average Credited Service		17.53		18.12		18.62		19.21	19.76
Average Entry Age		32.97		32.74		32.51		32.27	32.16
5. Average Annual Earnings	\$	84,954	\$	86,327	\$	87,374	\$	88,879	\$ 90,564
6. Number Vested		4,966		4,772		4,418		4,044	3,789
7. Percent Who Are Vested		96.9%		100.0%		100.0%		100.0%	100.0%
Retirees, Disabilitants, and Beneficia	aries								
1. Number		12,726		12,983		13,277		13,491	13,689
2. Average Age		69.85		70.36		70.78		71.30	71.85
Average Years Since Retirement		13.78		14.13		14.40		14.74	15.06
Average Monthly Pension Benefit									
a. Base	\$	2,204	\$	2,228	\$	2,273	\$	2,303	\$ 2,330
b. COLA ²		128		128		128		126	126
c. PRPA ²		529		506		488		518	519
d. Adjustment		0		0		0		0	0
e. Sick		60		62		65		67	68
f. Total	\$	2,921	\$	2,924	\$	2,954	\$	3,014	\$ 3,043
Vested Terminations (vested at term	inatio	on, not refu	unde	d contribu	tions	, or comm	nence	d benefit)	
1. Number		875		876		797		812	764
2. Average Age		50.25		50.82		51.01		51.71	52.37
Average Monthly Pension Benefit	\$	1,352	\$	1,441	\$	1,350	\$	1,534	\$ 1,579
		<u> </u>							
Non-Vested Terminations (not veste	d at t	erminatior	ı, not	refunded	cont	ributions)			
1. Number		2,103		1,994		1,900		1,810	1,744
2. Average Account Balance	\$	19,728	\$	20,290	\$	20,872	\$	21,612	\$ 22,591
Total Number of Members		20,827		20,625		20,392		20,157	19,986

¹ Includes 1,200 male active members and 2,589 female active members.

² Calculated by taking the average of the data field, as provided by the State of Alaska, for all participants in the group.

Summary of Members Included

			DB						
As of June 30, 2020	Tier 1		Tier 2		Total	DC	CR Tier 3	Gra	and Total
Active Members									
1. Number	198		3,591		3,789		5,332		9,121
2. Average Age	62.38		51.34		51.92		41.63		45.90
3. Average Credited Service	29.43		19.23		19.76		6.03		11.73
4. Average Entry Age	32.95		32.11		32.16		35.60		34.17
5. Annual Earnings									
a. Total	\$ 19,818,370	\$3	23,327,508	\$ 34	13,145,878	\$ 37	9,200,791	\$ 72	2,346,669
b. Average	\$ 100,093	\$	90,038	\$	90,564	\$	71,118	\$	79,196

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

As of June 30, 2020	Tier 1	Tier 2	Total
Retirees, Disabilitants, and Beneficiaries			
1. Number	10,542	3,147	13,689
2. Average Age	73.60	65.99	71.85
3. Average Years Since Retirement	17.79	5.93	15.06
4. Average Monthly Pension Benefit			
a. Base	\$ 2,361	\$ 2,226	\$ 2,330
b. COLA	147	54	126
c. PRPA	648	87	519
d. Adjustment	0	0	0
e. Sick	68	69	68
f. Total	\$ 3,224	\$ 2,436	\$ 3,043

Summary of Members Included

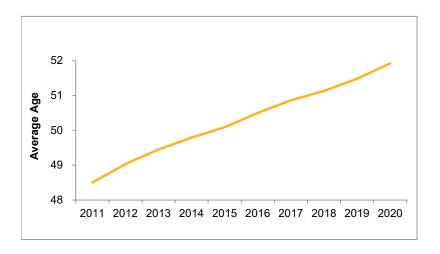
		Inactive Members									
As of June 30, 2020	Active Members	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members					
Retiree Medical Participants											
1. Retiree Coverage Only	3,746	7,602	0	0	361	7,963					
2. Retiree + Spouse	0	3,885	3,885	0	591	8,361					
3. Retiree + Children / Dependents	0	197	0	176	0	373					
4. Family	0	335	335	493	0	1,163					
5. Total	3,746	12,019	4,220	669	952	17,860					

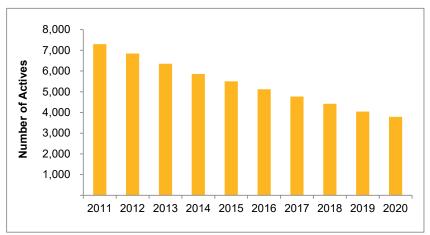
As of June 30, 2020	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
Retiree Medical Participants					
1. Pre-Medicare	2,359	1,323	669	941	5,292
2. Medicare Part A & B	9,458	2,871	0	11	12,340
3. Medicare Part B Only	202	26	0	0	228
4. Total	12,019	4,220	669	952	17,860

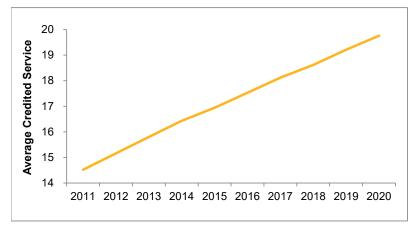
As of June 30, 2020	Retirees
Summary of Retiree Medical Data Received	
1. Retiree records on pension data	13,689
2. Remove duplicates on pension data	(497)
3. Valued in a different retiree healthcare plan ¹	(806)
4. Records without medical coverage	(428)
5. Medical only retirees	61
6. Total	12,019

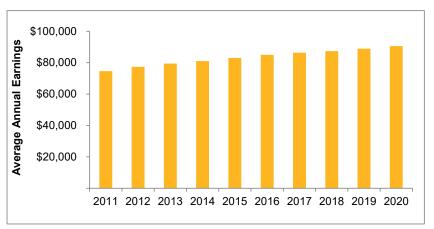
¹ Each member's retiree medical benefits are valued in the plan indicated in the data from Aetna

Summary of Members Included - Active Members at June 30









Average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 4.2: Age and Service Distribution of Active Members

Annual Earnings by Age

Total **Average** Annual **Annual** Earnings Age Number **Earnings** 0 - 19 0 \$ 0 \$ 0 20 - 24 0 0 0 25 - 29 0 0 0 30 - 34 0 0 0 81,615 35 - 39 108 8,814,458 40 - 44 620 53,157,156 85,737 45 - 49 946 84,739,069 89,576 50 - 54 914 84,313,377 92,247 55 - 59 664 60,808,948 91,580 60 - 64 336 31,398,776 93,449 65 - 69 96,111 129 12,398,268 70 - 74 6,101,808 105,204 58 75+ 14 1,414,018 101,001

Total 3,789 \$343,145,878 \$ 90,564

Annual Earnings by Credited Service

Years of Service	Number	Tot Ann Earni	ual	Average Annual Earnings
0	1	\$ 114	1,364	\$ 114,364
1	0		0	0
2	5	299	9,217	59,843
3	11	697	7,617	63,420
4	9	615	5,877	68,431
0 - 4	26	\$ 1,727	,075	\$ 66,426
5 - 9	107	7,872	2,695	73,577
10 - 14	408	33,442	2,468	81,967
15 - 19	1,429	126,346	3,957	88,416
20 - 24	1,226	114,657	7,353	93,521
25 - 29	436	42,742	2,931	98,034
30 - 34	115	11,417	7,158	99,280
35 - 39	29	2,995	5,562	103,295
40+	13	1,943	3,679	149,514
Total	3,789	\$343,145	5,878	\$ 90,564

Years of Credited Service by Age

	Years of Service												
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total			
0 - 19	0	0	0	0	0	0	0	0	0	0			
20 - 24	0	0	0	0	0	0	0	0	0	0			
25 - 29	0	0	0	0	0	0	0	0	0	0			
30 - 34	0	0	0	0	0	0	0	0	0	0			
35 - 39	0	6	41	60	1	0	0	0	0	108			
40 - 44	7	39	123	389	62	0	0	0	0	620			
45 - 49	6	30	106	378	397	29	0	0	0	946			
50 - 54	7	17	53	278	386	159	14	0	0	914			
55 - 59	3	10	45	182	231	142	46	5	0	664			
60 - 64	3	4	20	89	106	72	29	13	0	336			
65 - 69	0	1	14	35	29	25	18	5	2	129			
70 - 74	0	0	4	15	11	8	7	6	7	58			
75+	0	0	2	3	3	1	1	0	4	14			
Total	26	107	408	1,429	1,226	436	115	29	13	3,789			

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 4.3: Member Data Reconciliation

Pension

			In	active Membe	ers		
	Active Members	Due a Refund	Deferred Benefits	Retired Members	Disabled Members	Bene- ficiaries	Total
As of June 30, 2019	4,044	1,810	812	12,147	26	1,318	20,157
Vested Terminations	(120)	0	120	0	0	0	0
Non-Vested Terminations	(7)	7	0	0	0	0	0
Refund of Contributions	(2)	(46)	(2)	0	0	0	(50)
Disability Retirements	(1)	0	(1)	0	2	0	0
Age Retirements	(233)	(5)	(82)	328	(8)	0	0
Deaths With Beneficiary	(2)	(2)	(1)	(105)	0	110	0
Deaths Without Beneficiary	(1)	0	(2)	(101)	0	(42)	(146)
Data Corrections	1	4	0	1	0	(1)	5
Transfers In/Out	0	0	0	0	0	0	0
Rehires	110	(24)	(80)	(6)	0	0	0
Pick Ups*	0	0	0	3	0	17	20
Net Change	(255)	(66)	(48)	120	(6)	84	(171)
As of June 30, 2020	3,789	1,744	764	12,267	20	1,402	19,986

^{*} Pickup beneficiaries are primarily new DROs.

Healthcare

			In	active Members	5	
	Active Members	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
As of June 30, 2019	3,994	11,914	4,212	717	991	17,834
Vested Terminations	(74)	0	0	0	74	74
Non-Vested Terminations	(7)	0	0	0	0	0
Refund of Contributions	(2)	0	0	0	(2)	(2)
Disability Retirements	(1)	1	1	0	0	2
Age Retirements	(223)	223	106	50	0	379
Deferred Retirements	0	45	18	9	(45)	27
Retired without Medical Coverage	(36)	0	0	0	36	36
Deceased	(3)	(221)	(12)	(4)	(2)	(239)
New Beneficiaries	0	39	(39)	0	0	0
Added Retiree Medical Coverage	0	28	7	4	(28)	11
Added Dependent Coverage	0	0	39	31	0	70
Dropped Retiree Medical Coverage	0	(7)	(2)	(3)	7	(5)
Dropped Dependent Coverage	0	0	(106)	(136)	0	(242)
Rehires	105	(3)	(3)	(1)	(81)	(88)
Transfers In/Out	(7)	0	(1)	2	2	3
Net Change	(248)	105	8	(48)	(39)	26
As of June 30, 2020	3,746	12,019	4,220	669	952	17,860

Section 4.4: Schedule of Active Member Data

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase in Average Earnings	Number of Participating Employers
June 30, 2020	3,789	\$ 343,146	\$ 90,564	1.9%	56
June 30, 2019	4,044	359,426	88,879	1.7%	56
June 30, 2018	4,418	386,016	87,373	1.2%	56
June 30, 2017	4,772	411,951	86,327	1.6%	57
June 30, 2016	5,123	435,222	84,955	2.4%	57
June 30, 2015	5,502	456,636	82,995	2.4%	58
June 30, 2014	5,861	474,873	81,023	2.1%	58
June 30, 2013	6,352	504,260	79,386	2.6%	58
June 30, 2012	6,845	529,468	77,351	3.6%	58
June 30, 2011	7,303	545,155	74,648	3.5%	58

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 4.5: Active Member Payroll Reconciliation

Payroll Field	Payroll Data (000's)
a) DRB actual reported salaries FY20 in employer list	\$ 781,137
b) DRB actual reported salaries FY20 in valuation data	710,586
c) Annualized valuation data	722,347
d) Valuation payroll as of June 30, 2020	749,522
e) Rate payroll for FY21	741,090
f) Rate payroll for FY23	754,801

- a) Actual reported salaries from DRB employer listing showing all payroll paid during FY20, including those who were not active as of June 30, 2020
- b) Payroll from valuation data for people who are in active status as of June 30, 2020
- c) Payroll from (b) annualized for both new entrants and part-timers
- d) Payroll from (c) with one year of salary scale applied to estimate salaries payable for the upcoming year
- e) Payroll from (d) with the part-timer annualization removed
- Payroll from (e) with two years of assumed decrements and salary scale, and 0% population growth

Section 4.6: Summary of New Pension Benefit Recipients

During the Year Ending June 30	2016		2017		2018		2019		2020
Service									
1. Number		422		376	465		367		331
2. Average Age at Commencement		60.32		59.77	59.98		59.87		59.71
3. Average Monthly Pension Benefit	\$	3,190	\$	3,300	\$ 3,527	\$	3,562	\$	3,693
Survivor (including surviving spouse	and l	DROs)							
1. Number		104		108	87		96		127
2. Average Age at Commencement		72.15		70.57	71.61		74.36		74.16
3. Average Monthly Pension Benefit	\$	1,633	\$	1,643	\$ 2,022	\$	1,795	\$	1,903
Disability									
1. Number		4		3	3		5		2
2. Average Age at Commencement		50.48		43.30	49.92		51.51		53.65
3. Average Monthly Pension Benefit	\$	3,616	\$	3,678	\$ 3,625	\$	4,182	\$	3,019
Total									
1. Number		530		487	555		468		460
2. Average Age at Commencement		62.56		62.06	61.75		62.75		63.67
3. Average Monthly Pension Benefit	\$	2,888	\$	2,935	\$ 3,292	\$	3,206	\$	3,196

Summary of New Pension Benefit Recipients

Average Pension Benefit Payments

					Ye	ears	of Credited	d Serv	ice				
	() - 4	Ę	5 - 9	10 - 1	4	15 - 19	2	20 - 24	25	- 29	30	+
Period 7/1/2019 – 6/30/2020: Average Monthly Pension Number of Recipients	\$	243 8	\$	1,054 19	\$ 1,64 2	17 26	\$ 2,600 72	\$	3,616 90	\$ 4	,874 78	\$ 6,7	772 40
Period 7/1/2018 – 6/30/2019: Average Monthly Pension Number of Recipients	\$	334 4	\$	891 23	\$ 1,5 ²	10 39	\$ 2,760 87	\$	3,567 93	\$ 4	,666 85	\$ 6,7	777 41
Period 7/1/2017 – 6/30/2018: Average Monthly Pension Number of Recipients	\$	204 5	\$	899 21	\$ 1,58	33 61	\$ 2,583 85	\$	3,422 109	\$ 4	,580 130	\$ 6,0)83 57
Period 7/1/2016 – 6/30/2017: Average Monthly Pension Number of Recipients	\$	426 10	\$	795 22	\$ 1,62	26 60	\$ 2,433 75	\$	3,549 100	\$ 4	,536 64	\$ 6,3	351 48
Period 7/1/2015 – 6/30/2016: Average Monthly Pension Number of Recipients	\$	245 11	\$	1,002 31	\$ 1,53 8	35 32	\$ 2,540 69	\$	3,445 105	\$ 4	,472 74	\$ 6,^	168 54
Period 7/1/2014 – 6/30/2015: Average Monthly Pension Number of Recipients	\$	349 11	\$	1,041 33	\$ 1,34	12 70	\$ 2,205 67	\$	3,267 137	\$ 4	,220 125	\$ 5,9	900 94
Period 7/1/2013 – 6/30/2014: Average Monthly Pension Number of Recipients	\$	235 8	\$	904 31	\$ 1,43	35 31	\$ 2,398 28	\$	3,016 22	\$ 4	,073 18	\$ 7,4	185 12
Period 7/1/2012 – 6/30/2013: Average Monthly Pension Number of Recipients	\$	253 10	\$	1,030 57	\$ 1,49	96 67	\$ 2,450 90	\$	3,281 101	\$ 4	,384 79	\$ 6,0)52 64
Period 7/1/2011 – 6/30/2012: Average Monthly Pension Number of Recipients	\$	353 11	\$	1,064 43	\$ 1,5 ²	12 32	\$ 2,241 61	\$	3,276 118	\$ 4	,320 81	\$ 5,7	739 58
Period 7/1/2010 – 6/30/2011: Average Monthly Pension Number of Recipients	\$	146 5	\$	902 68	\$ 1,43	32 33	\$ 2,328 77	\$	3,131 118	\$ 4	,283 104	\$ 5,4	196 67

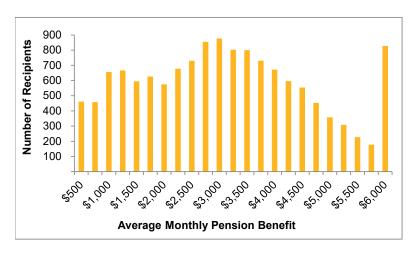
[&]quot;Average Monthly Pension" includes postretirement pension adjustments and cost-of-living increases.

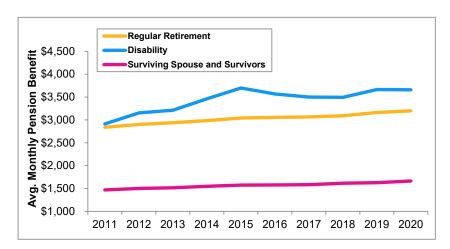
Beneficiaries are not included in the table above.

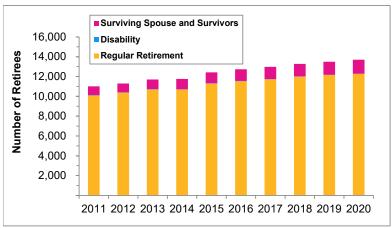
Section 4.7: Summary of All Pension Benefit Recipients

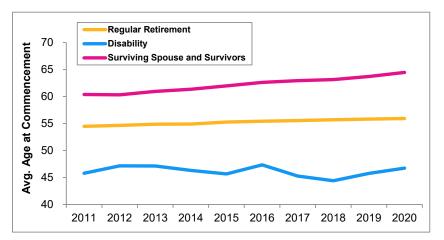
As of June 30	2016	2017	2018	2019	2020
Service					
Number, Fiscal Year Start	11,287	11,527	11,716	11,988	12,147
2. Net Change	240	189	272	159	120
3. Number, Fiscal Year End	11,527	11,716	11,988	12,147	12,267
4. Average Age at Commencement	55.43	55.55	55.70	55.82	55.93
5. Average Current Age	69.58	70.09	70.50	70.99	71.50
Average Monthly Pension Benefit	\$ 3,056	\$ 3,064	\$ 3,093	\$ 3,161	\$ 3,199
Surviving Spouse (including DROs)					
1. Number, Fiscal Year Start	1,096	1,168	1,237	1,261	1,315
2. Net Change	72	69	24	54	85
3. Number, Fiscal Year End	1,168	1,237	1,261	1,315	1,400
4. Average Age at Commencement	62.66	62.98	63.16	63.73	64.49
Average Current Age	73.07	73.42	73.90	74.65	75.26
6. Average Monthly Pension Benefit	\$ 1,580	\$ 1,584	\$ 1,618	\$ 1,629	\$ 1,665
Survivor (other than spouse)					
Number, Fiscal Year Start	6	3	3	3	3
2. Net Change	(3)	0	0	0	(1)
3. Number, Fiscal Year End	3	3	3	3	2
4. Average Age at Commencement	52.81	52.81	53.85	53.85	53.94
Average Current Age	57.22	58.22	60.65	61.65	61.56
Average Monthly Pension Benefit	\$ 746	\$ 746	\$ 749	\$ 765	\$ 705
Disability					
Number, Fiscal Year Start	29	28	27	25	26
2. Net Change	(1)	(1)	(2)	1	(6)
3. Number, Fiscal Year End	28	27	25	26	20
4. Average Age at Commencement	47.34	45.25	44.40	45.75	46.74
Average Current Age	51.56	50.34	50.02	51.08	51.73
6. Average Monthly Pension Benefit	\$ 3,568	\$ 3,500	\$ 3,494	\$ 3,666	\$ 3,658
Total					
Number, Fiscal Year Start	12,418	12,726	12,983	13,277	13,491
2. Net Change	308	257	294	214	198
3. Number, Fiscal Year End	12,726	12,983	13,277	13,491	13,689
4. Average Age at Commencement	56.07	56.24	56.38	56.56	56.79
5. Average Current Age	69.86	70.36	70.78	71.30	71.85
6. Average Monthly Pension Benefit	\$ 2,921	\$ 2,924	\$ 2,954	\$ 3,014	\$ 3,043

Summary of All Pension Benefit Recipients









Summary of All Pension Benefit Recipients

Distribution of Annual Pension Benefits for Benefit Recipients

Annual Pension Benefit by Age

Age	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0 - 19	0	\$ 0	\$ 0
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	0	0	0
35 - 39	0	0	0
40 - 44	9	299,742	33,305
45 - 49	50	1,612,221	32,244
50 - 54	271	11,563,720	42,671
55 - 59	694	28,938,378	41,698
60 - 64	1,790	64,688,013	36,139
65 - 69	2,947	101,954,915	34,596
70 - 74	3,267	114,457,481	35,034
75+	4,661	176,230,970	37,810

Total 13,689 \$499,745,440 \$ 36,507

Annual Pension Benefit by Years Since Commenced

Years Since Comm.	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0	424	\$ 16,038,365	\$ 37,826
1	474	18,545,041	39,125
2	489	19,895,682	40,686
3	489	18,221,604	37,263
4	488	18,011,169	36,908
0 - 4	2,364	\$ 90,711,861	\$ 38,372
5 - 9	2,567	96,336,262	37,529
10 - 14	2,040	65,979,522	32,343
15 - 19	2,129	68,283,318	32,073
20 - 24	2,340	86,223,222	36,848
25 - 29	926	35,961,261	38,835
30 - 34	978	42,877,347	43,842
35 - 39	247	10,143,876	41,068
40+	98	3,228,771	32,947

Total 13,689 \$499,745,440 \$ 36,507

Years Since Commencement by Age

	Years Since Commencement										
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total	
0 - 19	0	0	0	0	0	0	0	0	0	0	
20 - 24	0	0	0	0	0	0	0	0	0	0	
25 - 29	0	0	0	0	0	0	0	0	0	0	
30 - 34	0	0	0	0	0	0	0	0	0	0	
35 - 39	0	0	0	0	0	0	0	0	0	0	
40 - 44	6	2	1	0	0	0	0	0	0	9	
45 - 49	45	5	0	0	0	0	0	0	0	50	
50 - 54	210	48	11	0	2	0	0	0	0	271	
55 - 59	391	193	85	24	1	0	0	0	0	694	
60 - 64	756	551	291	146	42	3	0	0	1	1,790	
65 - 69	451	996	714	482	280	23	1	0	0	2,947	
70 - 74	226	504	602	918	770	173	68	4	2	3,267	
75+	279	268	336	559	1,245	727	909	243	95	4,661	
Total	2,364	2,567	2,040	2,129	2,340	926	978	247	98	13,689	

Section 4.8: Pension Benefit Recipients by Type of Benefit and Option Elected

Amount of Monthly	Number of	Туре	of Pension B	enefit	Option Selected				
Amount of Monthly Pension Benefit	Number of Recipients	1	2	3	1	2	3	4	
\$ 1 - 300	233	159	74	0	143	45	38	7	
301 – 600	394	276	118	0	213	72	86	23	
601 – 900	657	505	152	0	359	132	128	38	
901 – 1,200	827	656	171	0	487	162	144	34	
1,201 – 1,500	727	567	160	0	393	164	148	22	
1,501 – 1,800	729	562	167	0	411	157	138	23	
1,801 – 2,100	743	593	150	0	387	155	174	27	
2,101 - 2,400	828	704	124	0	371	203	224	30	
2,401 - 2,700	990	901	89	0	438	240	279	33	
2,701 - 3,000	1,053	984	66	3	444	247	329	33	
3,001 - 3,300	969	921	42	6	384	229	326	30	
3,301 - 3,600	938	905	31	2	386	197	330	25	
3,601 - 3,900	842	823	17	2	323	177	317	25	
3,901 - 4,200	739	723	13	3	290	162	267	20	
4,200+	3,020	2,988	28	4	1,118	524	1,277	101	
Total	13,689	12,267	1,402	20	6,147	2,866	4,205	471	

Type of Pension Benefit

- 1. Regular Retirement
- 2. Survivor Payment
- 3. Disability

Option Selected

- 1. Whole Life Annuity
- 2. 75% Joint and Contingent Annuity
- 3. 50% Joint and Contingent Annuity
- 4. 66 2/3% Joint and Survivor Annuity

Section 4.9: Pension Benefit Recipients Added to and Removed from Rolls

	Ad	Remo	Removed from Rolls			at End of Year	Percent Increase	Average	
Year Ended	No. ¹	Annual Pension Benefits	No.¹		Annual Pension Benefits	No. ¹	Annual Pension Benefits	in Annual Pension Benefits	Annual Pension Benefit
June 30, 2020	460	\$ 17,641,920	262	\$	5,527,983	13,689	\$ 499,745,440	2.5%	\$ 36,507
June 30, 2019	468	18,004,896	254		871,684	13,491	487,631,503	3.6%	36,145
June 30, 2018	555	21,924,986	261		6,926,129	13,277	470,498,291	3.3%	35,437
June 30, 2017	487	17,151,684	230		7,736,025	12,983	455,499,434	2.1%	35,084
June 30, 2016	530	18,364,581	222		6,144,109	12,726	446,083,775	2.8%	35,053
June 30, 2015	888	34,120,658	220		3,531,501	12,418	433,863,303	7.6%	34,938
June 30, 2014	226	5,964,256	181		(1,150,187)	11,750	403,274,146	1.8%	34,321
June 30, 2013	576	19,387,542	172		1,652,575	11,705	396,159,703	4.7%	33,845
June 30, 2012	473	17,104,564	188		(617,561)	11,301	378,424,736	4.9%	33,486
June 30, 2011	564	19,546,369	146		1,464,766	11,016	360,702,611	5.3%	32,744

¹ Numbers are estimated, and include other internal transfers.

Section 5: Basis of the Actuarial Valuation

Section 5.1: Summary of Plan Provisions

Effective Date

July 1, 1955, with amendments through June 30, 2020. Chapter 97, 1990 Session Laws of Alaska, created a two-tier retirement system. Members who were first hired under TRS before July 1, 1990 (Tier 1) are eligible for different benefits than members hired after June 30, 1990 (Tier 2). Chapter 9, 2005 Session Laws of Alaska, closed the plan to new members hired after June 30, 2006.

Administration of Plan

The Commissioner of Administration or the Commissioner's designee is the administrator of the system. The Attorney General of the state is the legal counsel for the system and shall advise the administrator and represent the system in legal proceedings.

Prior to June 30, 2005, the Teachers' Retirement Board prescribed policies and adopted regulations and performed other activities necessary to carry out the provisions of the system. The Alaska State Pension Investment Board, Department of Revenue, Treasury Division was responsible for investing TRS funds.

On July 27, 2005, Senate Bill 141, enacted as Chapter 9, 2005 Session laws of Alaska, replaced the Teachers' Retirement Board and the Alaska State Pension Investment Board with the Alaska Retirement Management Board.

Employers Included

Currently, there are 56 employers participating in TRS, including the State of Alaska, 52 school districts, and three other eligible organizations.

Membership

Membership in TRS is mandatory for the following employees hired before July 1, 2006:

- certificated full-time and part-time elementary and secondary teachers, certificated school nurses, and certificated employees in positions requiring teaching certificates;
- positions requiring a teaching certificate as a condition of employment in the Department of Education and Early Development and the Department of Labor and Workforce Development;
- University of Alaska full-time and part-time teachers, and full-time administrative employees in positions requiring academic standing if approved by the TRS administrator;
- certain full-time or part-time teachers of Alaska Native language or culture who have elected to be covered under TRS;
- members on approved sabbatical leave under AS 14.20.310;
- · certain State legislators who have elected to be covered under TRS; and
- a teacher who has filed for worker's compensation benefits due to an on-the-job assault and who, as a result of the physical injury, is placed on leave without pay.

Employees participating in the University of Alaska's Optional Retirement Plan or other retirement plans funded by the State are not covered by TRS.

Employees who work half-time in TRS and Public Employees' Retirement System (PERS) simultaneously are eligible for half-time TRS and PERS credit.

Senate Bill 141, signed into law on July 27, 2005, closes the plan effective July 1, 2006 to new members first hired on or after July 1, 2006.

Credited Service

TRS members receive a year of membership credit if they work a minimum of 172 days during the school year (July 1 through June 30 of the following year). Fractional credit is determined based on the number of days worked. Part-time members who work at least 50% of full-time receive membership credit for each day in proportion to full-time service. Credit is granted for all Alaskan public school service.

Members may claim other types of service, including:

- Outside teaching service in out-of-state schools or Alaska private schools (not more than ten years may be claimed);
- Military service (not more than five years of military service or ten years of combined outside and military service may be claimed);
- Alaska Bureau of Indian Affairs (BIA) service;
- Retroactive Alaskan service that was not creditable at the time it occurred, but later became creditable because of legislative change;
- Unused sick leave credit after members retire: and
- Leave of absence without pay.

Except for retroactive Alaska service that occurred before July 1, 1955, and unused sick leave, contributions are required for all claimed service.

Members receiving TRS disability benefits continue to earn TRS credit while disabled.

Survivors who are receiving occupational death benefits continue to earn TRS service credit while occupational survivor benefits are being paid.

Employer Contributions

TRS employers contribute the amounts required, in addition to employees' contributions, to fund the benefits of the system.

The normal cost rate is a uniform rate for all participating employers (less the value of members' contributions).

The past service rate is a uniform rate for all participating employers to amortize the unfunded past service liability with payments that are a level percentage of payroll amount over a closed 25-year period starting June 30, 2014. Effective June 30, 2018, each future year's unfunded service liability is separately amortized on a level percent of pay basis over 25 years.

Employer rates cannot be less than the normal cost rate.

Pursuant to AS14.25.070 effective July 1, 2008, each TRS employer will pay a simple uniform contribution rate of 12.56% of member payroll.

Additional State Contributions

Pursuant to AS14.25.085 effective July 1, 2008, the State shall contribute an amount (in addition to the State contribution as an employer) that, when combined with the employer contribution of 12.56%, will be sufficient to pay the total contribution rate adopted by the Board.

Member Contributions

Mandatory Contributions: Members are required to contribute 8.65% of their base salaries. Members' contributions are deducted from gross salaries before federal income taxes are withheld.

Contributions for Claimed Service: Member contributions are also required for most of the claimed service described above.

1% Supplemental Contributions: Members who joined the system before July 1, 1982 and elected to participate in the supplemental contributions provision are required to contribute an additional 1% of their salaries. Supplemental contributions are deducted from gross salaries after federal income taxes are withheld. Under the supplemental provision, an eligible spouse or dependent child will receive a survivor's allowance or spouse's pension if the member dies (see below). Supplemental contributions are only refundable upon death (see below).

Interest: Members' contributions earn 4.5% interest, compounded annually on June 30.

Refund of Contributions: Terminated members may receive refunds of their member contribution accounts which includes their mandatory contributions, indebtedness payments, and interest earned. Terminated members' accounts may be attached to satisfy claims under Alaska Statute 09.38.065, federal income tax levies, and valid Qualified Domestic Relations Orders.

Reinstatement of Contributions: Refunded accounts and the corresponding TRS service may be reinstated upon reemployment in TRS prior to July 1, 2010. Interest accrues on refunds until paid in full or members retire.

Retirement Benefits

Eligibility

- a. Members, including deferred vested members, are eligible for normal retirement at age 55 or early retirement at age 50 if they were hired before July 1, 1990 (Tier 1), and age 60 or early retirement at age 55 if they were hired on or after July 1, 1990 (Tier 2). Additionally, they must have at least:
 - (i) eight years of paid-up membership service;
 - (ii) 15 years of paid-up creditable service, the last five years of which are membership service, and they were first hired under TRS before July 1, 1975;
 - (iii) five years of paid-up membership service and three years of paid-up Alaska Bureau of Indian Affairs service;
 - (iv) 12 years of combined part-time and full-time paid-up membership service;
 - (v) two years of paid-up membership service if they are vested in PERS; or
 - (vi) one year of paid-up membership service if they are retired from PERS.
- b. Members may retire at any age when they have:
 - (i) 25 years of paid-up creditable service, the last five years of which are membership service;
 - (ii) 20 years of paid-up membership service;
 - (iii) 20 years of combined paid-up membership and Alaska Bureau of Indian Affairs service, the last five years of which are membership service; or
 - (iv) 20 years of combined paid-up part-time and full-time membership service.

Benefit Type

Lifetime benefits are paid to members. Eligible members may receive normal, unreduced benefits when they (1) reach normal retirement age and complete the service required; or (2) satisfy the minimum service requirements to retire at any age under (b) above. Members may receive early, actuarially reduced benefits when they reach early retirement age and complete the service required.

Members may select joint and survivor options and a last survivor option. Under these options and early retirement, benefits are actuarially adjusted so that members receive the actuarial equivalents of their normal benefit amounts.

Benefit Calculations

Retirement benefits are calculated by multiplying the average base salary (ABS) times the total TRS service times the percentage multiplier. The ABS is determined by averaging the salaries earned during the three highest school years. Members must earn at least 115 days of credit in a school year to include it in the ABS calculation. TRS pays a minimum benefit of \$25.00 per month for each year of service when the calculated benefit is less.

The percentage multipliers are 2% for the first 20 years and 2.5% for all remaining service. Service before July 1, 1990 is calculated at 2%.

Indebtedness

Members who terminate and refund their TRS contributions are not eligible to retire unless they return to TRS employment and pay back their refunds plus interest or accrue additional service which qualifies them for retirement. TRS refunds must be paid in full if the corresponding service is to count toward the minimum service requirements for retirement. Refunded TRS service is included in total service for the purpose of calculating retirement benefits. However, when refunds are not completely paid before retirement, benefits are actuarially reduced for life. Indebtedness balances may also be created when a member purchases qualified claimed service.

Reemployment of Retired Members

Retirees who return to work in a permanent full-time or part-time TRS position after a Normal Retirement are eligible to return under the Standard Option.

Under the Standard Option, retirement and retiree healthcare benefits are suspended while retired members are reemployed under TRS. During reemployment, members earn additional TRS service and contributions are withheld from their wages.

Members retired under the Retirement Incentive Programs (RIPs) who return to employment will:

- a. forfeit the three years of incentive credits that they received;
- b. owe TRS 110% of the benefits that they received under the RIP, which may include costs for health insurance, excluding amounts that they paid to participate; and
- c. be charged 7% interest from the date that they are reemployed until their indebtedness is paid in full or they retire again. If the indebtedness is not completely paid, future benefits will be actuarially reduced for life.

Employers make contributions to the unfunded liability of the plan on behalf of rehired retired members at the rate the employer is making contributions to the unfunded liability of the plan for other members.

Postemployment Healthcare Benefits

When pension benefits begin, major medical benefits are provided by TRS to (1) all employees first hired before July 1, 1990 (Tier 1) and their surviving spouses and (2) members and their surviving spouses who have 25 years of membership service, are disabled or age 60 or older, regardless of their initial hire dates. Employees first hired after June 30, 1990 (Tier 2) and their surviving spouses may receive major medical benefits prior to age 60 by paying premiums.

Medical, prescription drug, dental, vision, and audio coverage is provided through the AlaskaCare Retiree Health Plan. Health plan provisions do not vary by retirement tier or age, except for Medicare coordination. Participants in dental, vision, and audio coverage pay a full self-supporting rate and those benefits are not included in this valuation.

Surviving spouses continue coverage only if a pension payment form that provided survivor benefits was elected. Alternate payees (i.e. individuals who are the subject of a domestic relations order or DRO) are allowed to participate in the plan, but must pay the full cost.

Where premiums are required prior to age 60 (Tier 2), the valuation bases this payment upon the age of the retiree.

Participants in the defined benefit plan are covered under the following benefit design:

Plan Feature	Amounts
Deductible (single/family)	\$150 / \$450
Coinsurance (most services)	20%
Outpatient surgery/testing	0%
Maximum Out-of-Pocket (single/family, excluding deductible)	\$800 / \$2,400
Rx Copays (generic/brand/mail-order), does not apply to OOP max	\$4 / \$8 / \$0
Lifetime Maximum	\$2,000,000

The plan coordinates with Medicare on a traditional Coordination of Benefits Method. Starting in 2019, the prescription drug coverage is through a Medicare Part D EGWP arrangement.

Disability Benefits

Monthly disability benefits are paid to permanently disabled members until they die, recover, or become eligible for normal retirement. To be eligible, members must have at least five years of paid-up membership service.

Disability benefits are equal to 50% of the member's base salary at the time of disability. The benefit is increased by 10% of the base salary for each minor child, up to a maximum of 40%. Members continue to earn TRS service until eligible for normal retirement.

Members are appointed to normal retirement on the first of the month after they become eligible.

Death Benefits

Monthly death benefits may be paid to a spouse or dependent children upon the death of a member. If monthly benefits are not payable under the supplemental contributions provision or occupational and non-occupational death provisions, the designated beneficiary receives the lump sum benefit described below.

Occupational Death

When an active member dies from occupational causes, a monthly survivor's pension may be paid to the spouse, unless benefits are payable under the supplemental contributions provision (see below). The pension equals 40% of the member's base salary on the date of death or disability, if earlier. If there is no spouse, the pension may be paid to the member's dependent children. On the member's normal retirement date, the benefit converts to a normal retirement benefit. The normal benefit is based on the member's average base salary on the date of death and service, including service accumulated from the date of the member's death to the normal retirement date.

Non-Occupational Death

When a vested member dies from non-occupational causes, the surviving spouse may elect to receive a monthly 50% joint and survivor benefit or a lump sum benefit, unless benefits are payable under the supplemental contributions provision (see below). The monthly benefit is calculated on the member's average base salary and TRS service accrued at the time of death.

Lump Sum Benefit

Upon the death of an active member who has less than one year of service or an inactive member who is not vested, the designated beneficiary receives the member's contribution account, which includes mandatory contributions, indebtedness payments, and interest earned. Any supplemental contributions will also be refunded. If the member has more than one year of TRS service or is vested, the beneficiary also receives \$1,000 and \$100 for each year of TRS service, up to a maximum of \$3,000. An additional \$500 may be payable if the member is survived by dependent children.

Supplemental Contributions Provision

Members are eligible for supplemental coverage if they joined TRS before July 1, 1982, elected to participate in the supplemental provision, and made the required contributions. A survivor's allowance or spouse's pension (see below) may be payable if the member made supplemental contributions for at least one year and dies while in membership service or while disabled under TRS. In addition, the allowance and pension may be payable if the member dies while retired or in deferred vested status if supplemental contributions were made for at least five years.

- a. **Survivor's Allowance:** If the member is survived by dependent children, the surviving spouse and dependent children are entitled to a survivor's allowance. The allowance for the spouse is equal to 35% of the member's base salary at the time of death or disability, plus 10% for each dependent child up to a maximum of 40%. The allowance terminates and a spouse's pension becomes payable when there is no longer an eligible dependent child.
- b. **Spouse's Pension:** The spouse's pension is equal to 50% of the retirement benefit that the deceased member was receiving or the unreduced retirement benefit that the deceased member would have received if retired at the time of death. The spouse's pension begins on the first of the month after the member's death or termination of the survivor's allowance.

Death After Retirement

If a joint and survivor option was selected at retirement, the eligible spouse receives continuing, lifetime monthly benefits after the member dies. A survivor's allowance or spouse's pension may be payable if the member participated in the supplemental contributions provision. If a joint and survivor option was not selected and benefits are not payable under the supplemental contributions provision, the designated beneficiary receives the member's contribution account, less any benefits already paid and the member's last benefit check

Postretirement Pension Adjustments

Postretirement pension adjustments (PRPAs) are granted annually to eligible benefit recipients when the consumer price index (CPI) for urban wage earners and clerical workers for Anchorage increases during the preceding calendar year. PRPAs are calculated by multiplying the recipient's base benefit including past PRPAs, but excluding the Alaska COLA, times:

- a. 75% of the CPI increase in the preceding calendar year or 9%, whichever is less, if the recipient is at least age 65 or on TRS disability; or
- b. 50% of the CPI increase in the preceding calendar year or 6%, whichever is less, if the recipient is at least age 60, or under age 60 if the recipient has been receiving benefits for at least eight years.

Ad hoc PRPAs, up to a maximum of 4%, may be granted to eligible recipients who were first hired before July 1, 1990 (Tier 1) if the CPI increases and the funded ratio is at least 105%.

In a year where an ad hoc PRPA is granted, eligible recipients will receive the higher of the two calculations.

Alaska Cost-of-Living Allowance (COLA)

Eligible benefit recipients who reside in Alaska receive an Alaska COLA equal to 10% of their base benefits. The following benefit recipients are eligible:

- a. members who were first hired under TRS before July 1, 1990 (Tier 1) and their survivors;
- b. members who were first hired under TRS after June 30, 1990 (Tier 2) and their survivors if they are at least age 65; and
- c. all disabled members.

Changes in Benefit Provisions Valued Since the Prior Valuation

There were no changes in benefit provisions since the prior valuation.

Section 5.2: Description of Actuarial Methods and Valuation Procedures

The funding method used in this valuation was adopted by the Board in October 2006. Changes in methods were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017. The asset smoothing method used to determine valuation assets was changed effective June 30, 2014.

Benefits valued are those delineated in Alaska State statutes as of the valuation date. Changes in State statutes effective after the valuation date are not taken into consideration in setting the assumptions and methods.

Actuarial Cost Method

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method, level percent of pay.

Effective June 30, 2018, the Board adopted a layered UAAL amortization method: Layer #1 equals the sum of (i) the UAAL at June 30, 2018 based on the 2017 valuation, plus (ii) the FY18 experience gain/loss. Layer #1 is amortized over the remainder of the 25-year closed period that was originally established in 2014¹. Layer #2 equals the change in UAAL at June 30, 2018 due to the experience study and EGWP implementation. Layer #2 is amortized over a separate closed 25-year period starting in 2018. Future layers will be created each year based on the difference between actual and expected UAAL occurring that year, and will be amortized over separate closed 25-year periods. The UAAL amortization continues to be on a level percent of pay basis. State statutes allow the contribution rate to be determined on payroll for all members, defined benefit and defined contribution member payroll combined.

Projected pension and postemployment healthcare benefits were determined for all active members. Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year from the assumed entry age to the assumed retirement age were applied to the projected benefits to determine the normal cost (the portion of the total cost of the plan allocated to the current year under the method). The normal cost is determined by summing intermediate results for active members and determining an average normal cost rate which is then related to the total payroll of active members. The actuarial accrued liability for active members (the portion of the total cost of the plan allocated to prior years under the method) was determined as the excess of the actuarial present value of projected benefits over the actuarial present value of future normal costs.

The actuarial accrued liability for retired members and their beneficiaries currently receiving benefits, terminated vested members and disabled members not yet receiving benefits was determined as the actuarial present value of the benefits expected to be paid. No future normal costs are payable for these members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of plan assets measured on the valuation date.

Under this method, experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

¹ Layer #1 is referred to as "initial amount" in Sections 1.2 and 1.3.

Valuation of Assets

The actuarial asset value was reinitialized to equal Fair Value of Assets as of June 30, 2014. Beginning in FY15, the asset valuation method recognizes 20% of the gain or loss each year, for a period of five years. All assets are valued at fair value. Assets are accounted for on an accrued basis and are taken directly from financial statements audited by KPMG LLP.

Changes in Methods Since the Prior Valuation

There were no changes in the asset or valuation methods since the prior valuation.

Valuation of Retiree Medical and Prescription Drug Benefits

This section outlines the detailed methodology used in the internal model developed by Buck to calculate the initial per capita claims cost rates for the TRS postemployment healthcare plan. Note that the methodology reflects the results of our annual experience rate update for the period from July 1, 2019 to June 30, 2020.

Base claims cost rates are incurred healthcare costs expressed as a rate per member per year. Ideally, claims cost rates should be derived for each significant component of cost that can be expected to require differing projection assumptions or methods (i.e., medical claims, prescription drug claims, administrative costs, etc). Separate analysis is limited by the availability and historical credibility of cost and enrollment data for each component of cost. This valuation reflects non-prescription claims separated by Medicare status, including eligibility for free Part A coverage. Prescription costs are analyzed separately as in prior valuations. Administrative costs are assumed in the final per capita claims cost rates used for valuation purposes, as described below. Analysis to date on Medicare Part A coverage is limited since Part A claim data is not available by individual, nor is this status incorporated into historical claim data.

Benefits

Medical, prescription drug, dental, vision and audio coverage is provided through the AlaskaCare Retiree Health Plan and is available to employees of the State and subdivisions who meet retirement criteria based on the retirement plan tier in effect at their date of hire. Health plan provisions do not vary by retirement tier or age, except for Medicare coordination for those Medicare-eligible. Dental, vision and audio claims (DVA) are excluded from data analyzed for this valuation because those are retiree-pay all benefits where rates are assumed to be self-supporting. Buck relies upon rates set by a third-party for the DVA benefits. Buck reviewed historical rate-setting information and views contribution rate adjustments made are not unreasonable.

Administration and Data Sources

The plan was administered by Wells Fargo Insurance Services (acquired by HealthSmart, in January 2012) from July 1, 2009 through December 31, 2013 and by Aetna effective January 1, 2014.

Claims incurred for the period from July 2018 through June 2020 (FY19 through FY20) were provided by the State of Alaska from reports extracted from their data warehouse, which separated claims by Medicare status. Monthly enrollment data for the same period was provided by Aetna.

Aetna also provided census information identifying Medicare Part B only participants. These participants are identified when hospital claims are denied by Medicare; Aetna then flags that participant as a Part B only participant. Buck added newly identified participants to our list of Medicare Part B only participants. Buck assumes that once identified as Part B only, that participant remains in that status until we are notified otherwise.

Aetna provided a snapshot file as of July 1, 2020 of retirees and dependents that included a coverage level indicator. The monthly enrollment data includes double coverage participants. These are participants whereby both the retiree and spouse are retirees from the State and both are reflected with Couple coverage in the enrollment. In this case, such a couple would show up as four members in the

monthly enrollment (each would be both a retiree and a spouse). As a result, the snapshot census file was used to adjust the total member counts in the monthly enrollment reports to estimate the number of unique participants enrolled in coverage. Based on the snapshot files from the last two valuations, the total member count in the monthly enrollment reports needs to be reduced by approximately 13% to account for the number of participants with double coverage.

Aetna does not provide separate experience by Medicare status in standard reporting so the special reports mentioned above from the data warehouse were used this year to obtain that information and incorporate it into the per capita rate development for each year of experience (with corresponding weights applied in the final per capita cost).

Methodology

Buck projected historical claim data to FY21 for retirees using the following summarized steps:

- 1. Develop historical annual incurred claim cost rates an analysis of medical costs was completed based on claims information and enrollment data provided by the State of Alaska and Aetna for each year in the experience period of FY19 through FY20.
 - Costs for medical services and prescriptions were analyzed separately, and separate trend rates
 were developed to project expected future medical and prescription costs for the valuation year
 (e.g. from the experience period up through FY21).
 - Because the reports provided reflected incurred claims, no additional adjustment was needed to determine incurred claims to be used in the valuation.
 - An offset for costs expected to be reimbursed by Medicare was incorporated beginning at age 65. Alaska retirees who do not have 40 quarters of Medicare-covered compensation do not qualify for Medicare Part A coverage free of charge. This is a relatively small and closed group. Medicare was applied to State employment for all employees hired after March 31, 1986. For the "no-Part A" individuals who are required to enroll in Medicare Part B, the State is the primary payer for hospital bills and other Part A services. Claim experience is not available separately for participants with both Medicare Parts A and B and those with Part B only. For Medicare Part B only participants, a lower average claims cost was applied to retirees covered by both Medicare Part A and B vs. retirees covered only by Medicare Part B based upon manual rate models that estimate the Medicare covered proportion of medical costs. To the extent that no-Part A claims can be isolated and applied strictly to the appropriate closed group, actuarial accrued liability will be more accurate.
 - Based on census data received from Aetna, less than 1% of the current retiree population was identified as having coverage only under Medicare Part B. We assume that 5% of actives hired before April 1, 1986 and current retirees who are not yet Medicare eligible will not be eligible for Medicare Part A.
 - Based upon a reconciliation of valuation census data to the snapshot eligibility files provided by Aetna as of July 1, 2019, and July 1, 2020, Buck adjusted member counts used for duplicate records where participants have double coverage; i.e. primary coverage as a retiree and secondary coverage as the covered spouse of another retiree. This is to reflect the total cost per distinct individual/member which is then applied to distinct members in the valuation census.
 - Buck understands that pharmacy claims reported do not reflect rebates. Based on actual
 pharmacy rebate information provided by Aetna for years through 2018 and Optum for January
 2019 through June 2020, rebates were assumed to be 17% of prescription drug claims for FY19
 and 19.5% of prescription drug claims for FY20.
- 2. Develop estimated EGWP reimbursements Segal provided estimated 2021 EGWP subsidies, developed with the assistance of OptumRx. These amounts are applicable only to Medicare-eligible participants.

- 3. Adjust for claim fluctuation, anomalous experience, etc. explicit adjustments are often made for anticipated large claims or other anomalous experience. FY19 and FY20 experience were compared to assess the impact of COVID-19 and whether an adjustment to FY20 claims was indicated for use in the June 30, 2020 valuation. A material decrease in medical claims during March 2020 to June 2020 was experienced due to COVID-19. Therefore, an adjustment was made for those months to adjust for the decrease that is not expected to continue in future years. There was an observed spike in prescription drug claims in March 2020; however, the FY20 prescription drug experience appears reasonable to use without adjustment for COVID-19. To adjust for the decrease in medical claims due to COVID-19 during the last 4 months of FY20, the per capita cost during the first 8 months was used as the basis for estimating claims that would have occurred in the absence of COVID-19. Due to group size and demographics, we did not make any additional large claim adjustments. We do blend both Alaska plan-specific and national trend factors as described below. Buck compared data utilized to lag reports and quarterly plan experience presentations provided by the State and Aetna to assess accuracy and reasonableness of data.
- 4. Trend all data points to the projection period project prior years' experience forward to FY21 for retiree benefits on an incurred claim basis. Trend factors derived from historical Alaska-specific experience and national trend factors are shown in the table in item 5 below.
- 5. Apply credibility to prior experience adjust prior year's data by assigning weight to recent periods, as shown at the right of the table below. The Board approved a change in the weighting of experience periods beginning with the June 30, 2017 valuation as outlined below. Note also that we averaged projected plan costs using Alaska-specific trend factors and national trend factors, assigning 75% weight to Alaska-specific trends and 25% to national trends:

Alaska-Specific and National Average Weighted Trend from Experience Period to Valuation Year					
Experience Period Medical Prescription Weighting Factors					
FY19 to FY20	7.3% Pre-Medicare / 4.6% Medicare	1.2%	50%		
FY20 to FY21	6.3% Pre-Medicare / 5.2% Medicare	7.6%	50%		

Trend assumptions used for rate development are assessed annually and as additional/improved reporting becomes available, we will incorporate into rate development as appropriate.

6. Develop separate administration costs – no adjustments were made for internal administrative costs. Third party retiree plan administration fees for FY21 are based upon total fees projected to 2021 by Segal based on actual FY20 fees. The annual per participant per year administrative cost rate for medical and prescription benefits is \$449.

Healthcare Reform

Healthcare Reform legislation passed on March 23, 2010 included several provisions with potential implications for the State of Alaska Retiree Health Plan liability. Buck evaluated the impact due to these provisions.

Because the State plan is retiree-only, and was in effect at the time the legislation was enacted, not all provisions of the health reform legislation apply to the State plan. Unlimited lifetime benefits and dependent coverage to age 26 are two of these provisions. We reviewed the impact of including these provisions, but there was no decision made to adopt them, and no requirement to do so.

Because Transitional Reinsurance fees are only in effect until 2016, we excluded these for valuation purposes.

The Further Consolidated Appropriations Act, 2020 passed in December 2019 repealed several healthcare-related taxes, including the Cadillac Tax.

The Tax Cuts and Jobs Act passed in December 2017 included the elimination of the individual mandate penalty and changed the inflation measure for purposes of determining the limits for the High Cost Excise Tax to use chained CPI. It is our understanding the law does not directly impact other provisions of the ACA. While the nullification of the ACA's individual mandate penalty does not directly impact employer group health plans, it could contribute to the destabilization of the individual market and increase the number of uninsured. Such destabilization could translate to increased costs for employers. We have considered this when setting our healthcare cost trend assumptions and will continue to monitor this issue.

We have not identified any other specific provisions of healthcare reform or its potential repeal that would be expected to have a significant impact on the measured obligation. We will continue to monitor legislative activity.

Data

In accordance with actuarial standards, we note the following specific data sources and steps taken to value retiree medical benefits:

The Division of Retirement and Benefits provided pension valuation census data, which for people currently in receipt of healthcare benefits was supplemented by coverage data from the healthcare claims administrator (Aetna).

Certain adjustments and assumptions were made to prepare the data for valuation:

- Some records provided on the Aetna data were associated with a participant social security number
 not listed on the RIN-to-SSN translation file. We reconciled those participants with the pension
 valuation data as either a surviving spouse or a retiree in the appropriate plan based on account
 structure information in the Aetna data.
- All records provided with retiree medical coverage on the Aetna data were included in this valuation and we relied on the Aetna data as the source of medical coverage for current retirees and their dependents.
- Some records in the Aetna data were duplicates due to the double coverage (i.e. coverage as a retiree
 and as a spouse of another retiree) allowed under the plan. Records were adjusted for these members
 so that each member was only valued once. Any additional value of the double coverage (due to
 coordination of benefits) is small and reflected in the per capita costs.
- Covered children included in the Aetna data were valued until age 23, unless disabled. We assumed that those dependents over 23 were only eligible and valued due to being disabled.
- For individuals included in the pension data expecting a future pension, we valued health benefits starting at the same point that the pension benefit is assumed to start.

We are not aware of any other data issues that would be expected to have a material impact on the results and there are no unresolved matters related to the data.

The chart below shows the basis of setting the per capita claims cost assumption, which includes both PERS and TRS.

	Medical				Prescription Drugs (Rx)			
	Pre	e-Medicare		Medicare	Pı	re-Medicare		ledicare
A. Fiscal 2019								
1. Incurred Claims	\$ 2	30,731,518	\$	80,855,220	\$	63,846,605	\$ 18	83,281,273
2. Adjustments for Rx Rebates		<u>0</u>		<u>0</u>		(10,853,923)		31,157,816)
3. Net incurred claims	\$ 2	30,731,518	\$	80,855,220	\$	52,992,682	\$ 1	52,123,456
4. Average Enrollment		20,625		42,843		20,625		42,843
5. Claim Cost Rate (3) / (4)		11,187		1,887		2,569		3,551
6. Trend to Fiscal 2021		1.141		1.101		1.089		1.089
7. Fiscal 2021 Incurred Cost Rate (5) x (6)	\$	12,762	\$	2,077	\$	2,798	\$	3,867
B. Fiscal 2020								
1. Incurred Claims	\$ 2	29,531,664	\$	89,497,345	\$	64,442,660	\$ 18	88,022,328
2. Adjustments for Rx Rebates		<u>0</u>		<u>0</u>		(12,566,319)	(<u>36,664,354)</u>
3. Net incurred claims	\$ 2	29,531,664	\$	89,497,345	\$	51,876,341	\$ 1	51,357,974
Average Enrollment		19,354		44,965		19,354		44,965
5. Claim Cost Rate (3) / (4)		11,860		1,990		2,680		3,366
6. Trend to Fiscal 2021		1.063		1.052		1.076		1.076
7. Fiscal 2021 Incurred Cost Rate (5) x (6)	\$	12,609	\$	2,094	\$	2,885	\$	3,623
		Med	dica	I		Prescription	Dru	gs (Rx)
	Pre	e-Medicare		Medicare	Pı	re-Medicare	M	ledicare
C. Incurred Cost Rate by Fiscal Year								
1. Fiscal 2019 A.(7)		12,762		2,077		2,798		3,867
2. Fiscal 2020 B.(7)		12,609		2,094		2,885		3,623
D. Weighting by Fiscal Year								
1. Fiscal 2019		50%		50%		50%		50%
2. Fiscal 2020		50%		50%		50%		50%
E. Fiscal 2021 Incurred Cost Rate								
1. Rate at Average Age C x D	\$	12,685	\$	2,086	\$	2,842	\$	3,745
2. Average Aging Factor		0.826		1.263		0.838		1.121
3. Rate at Age 65 (1) / (2)	\$	15,360	\$	1,651	\$	3,393	\$	3,340
F. Development of Part A&B and Part B								
Only Cost from Pooled Rate Above								
Part A&B Average Enrollment				44,568				
Part B Only Average Enrollment				398				
3. Total Medicare Average Enrollment B(4)				44,965				
4. Cost ratio for those with Part B only to				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
those with Parts A&B				3.300				
5. Factor to determine cost for those with								
Parts A&B (2) / (3) x (4) + (1) / (3) x 1.00				1.020				
6. Medicare per capita cost for all				V				
participants: E(3)			\$	1,651				
7. Cost for those eligible for Parts A&B: (6)	/ (5)		\$	1,618	1			
8. Cost for those eligible for Part B only: (7)			\$	5,340				
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Following the development of total projected costs, a distribution of per capita claims cost was developed. This was accomplished by allocating total projected costs to the population census used in the valuation. The allocation was done separately for each of prescription drugs and medical costs for the Medicare eligible and pre-Medicare populations. The allocation weights were developed using participant counts by age and assumed morbidity and aging factors. Results were tested for reasonableness based on historical trend and external benchmarks for costs paid by Medicare.

Below are the results of this analysis:

Distribution of Per Capita Claims Cost by Age for the Period July 1, 2020 through June 30, 2021

Age	Medical and Medicare Parts A & B	Medical and Medicare Part B Only	Prescription Drug	Medicare EGWP Subsidy	
45	\$ 9,374	\$ 9,374	\$ 2,072	\$ 0	
50	10,605	10,605	2,461	0	
55	11,999	11,999	2,923	0	
60	13,576	13,576	3,149	0	
65	1,618	5,340	3,340	1,003	
70	1,876	6,191	3,688	1,107	
75	2,174	7,177	4,071	1,223	
80	2,401	7,923	3,971	1,192	

Section 5.3: Summary of Actuarial Assumptions

The demographic and economic assumptions used in the June 30, 2020 valuation are described below. Unless noted otherwise, these assumptions were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017.

Investment Return

7.38% per year, net of investment expenses.

Salary Scale

Salary scale rates based upon the 2013-2017 actual experience (see Table 1).

Inflation – 2.50% per year.

Productivity – 0.25% per year.

Payroll Growth

2.75% per year (inflation + productivity).

Total Inflation

Total inflation as measured by the Consumer Price Index for urban and clerical workers for Anchorage is assumed to increase 2.50% annually.

Mortality (Pre-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

RP-2014 white-collar employee table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Deaths are assumed to result from occupational causes 15% of the time.

Mortality (Post-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

93% of male and 90% of female rates of RP-2014 white-collar healthy annuitant table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Turnover

Select and ultimate rates based upon the 2013-2017 actual experience (see Table 2).

Disability

Incidence rates based upon the 2013-2017 actual experience (see Table 3).

Post-disability mortality in accordance with the RP-2014 disabled table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Retirement

Retirement rates based upon the 2013-2017 actual experience (see Table 4).

Deferred vested members are assumed to retire at their earliest unreduced retirement date.

The modified cash refund annuity is valued as a three-year certain and life annuity.

Spouse Age Difference

Males are assumed to be three years older than their wives. Females are assumed to be two years younger than husbands.

Percent Married for Pension

85% of male members and 75% of female members are assumed to be married at termination from active service.

Dependent Spouse Medical Coverage Election

Applies to members who do not have double medical coverage. 65% of male members and 60% of female members are assumed to be married and cover a dependent spouse.

Dependent Children

- Pension: For the participants who are assumed to be married, those between ages 25 and 45 are assumed to have two dependent children.
- Healthcare: Benefits for dependent children have been valued only for members currently covering their dependent children. These benefits are only valued through the dependent children's age 23 (unless the child is disabled).

Contribution Refunds

0% of terminating members with vested benefits are assumed to have their contributions refunded. 100% of those with non-vested benefits are assumed to have their contributions refunded.

Imputed Data

Data changes from the prior year which are deemed to have an immaterial impact on liabilities and contribution rates are assumed to be correct in the current year's client data. Non-vested terminations with appropriate refund dates are assumed to have received a full refund of contributions. Active members with missing salary and service are assumed to be terminated with status based on their vesting percentage.

Active Rehire Assumption

The Normal Cost used for determining contribution rates and in the projections includes a rehire assumption to account for anticipated rehires. The Normal Cost shown in the report includes the following assumptions (which were developed based on the five years of rehire loss experience through June 30, 2017). For projections, these assumptions were assumed to grade to zero uniformly over a 20-year period.

Pension: 15.57%Healthcare: 12.03%

Re-Employment Option

All re-employed retirees are assumed to return to work under the Standard Option.

Active Data Adjustment

No adjustment was made to reflect participants who terminate employment before the valuation date and are subsequently rehired after the valuation date.

Alaska Cost-of-Living Adjustments (COLA)

Of those benefit recipients who are eligible for the Alaska COLA, 60% are assumed to remain in Alaska and receive the COLA.

Postretirement Pension Adjustment (PRPA)

50% and 75% of assumed inflation, or 1.25% and 1.875% respectively, is valued for the annual automatic PRPA as specified in the statute.

Expenses

The investment return assumption is net of investment expenses. The Normal Cost as of June 30, 2020 was increased by the following amounts for administrative expenses (for projections, the percent increase was assumed to remain constant in future years):

Pension: \$3,003,000Healthcare: \$1,362,000

Part-Time Status

Part-time employees are assumed to earn 0.75 years of credited service per year.

Sick Leave

4.5 days of unused sick leave for each year of service are assumed to be available to be credited once the member is retired, terminates or dies.

Service

Total credited service is provided by the State. This service is assumed to be the only service that should be used to calculate benefits. Additionally, the State provides claimed service (including Bureau of Indian Affairs Service). Claimed service is used for vesting and eligibility purposes as described in Section 5.1.

Final Average Earnings

Final Average Earnings is provided on the data for active members. This amount is used as a minimum in the calculation of the average earnings in the future.

Per Capita Claims Cost

Sample claims cost rates adjusted to age 65 for FY21 medical and prescription drugs are shown below:

	Medical		Prescrip	tion Drugs
Pre-Medicare	\$	15,360	\$	3,393
Medicare Parts A & B	\$	1,618	\$	3,340
Medicare Part B Only	\$	5,340	\$	3,340
Medicare Part D – EGWP		N/A	\$	1,003

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2021 fiscal year (July 1, 2020 – June 30, 2021).

The EGWP subsidy is assumed to increase in future years by the trend rates shown on the following pages. No future legislative changes or other events are anticipated to impact the EGWP subsidy. If any legislative or other changes occur in the future that impact the EGWP subsidy (which could either increase or decrease the plan's Actuarial Accrued Liability), those changes will be evaluated and quantified when they occur.

Third Party Administrator Fees

\$449 per person per year; assumed to increase at 4.5% per year.

Medicare Part B Only

We assume that 5% of actives hired before April 1, 1986 and current retirees who are not yet Medicare eligible will not be eligible for Medicare Part A.

Healthcare Cost Trend

The table below shows the rate used to project the cost from the shown fiscal year to the next fiscal year. For example, 6.5% is applied to the FY21 pre-Medicare medical claims costs to get the FY22 medical claims costs.

	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY21	6.5%	5.4%	7.5%
FY22	6.3%	5.4%	7.1%
FY23	6.1%	5.4%	6.8%
FY24	5.9%	5.4%	6.4%
FY25	5.8%	5.4%	6.1%
FY26	5.6%	5.4%	5.7%
FY27-FY40	5.4%	5.4%	5.4%
FY41	5.3%	5.3%	5.3%
FY42	5.2%	5.2%	5.2%
FY43	5.1%	5.1%	5.1%
FY44	5.1%	5.1%	5.1%
FY45	5.0%	5.0%	5.0%
FY46	4.9%	4.9%	4.9%
FY47	4.8%	4.8%	4.8%
FY48	4.7%	4.7%	4.7%
FY49	4.6%	4.6%	4.6%
FY50+	4.5%	4.5%	4.5%

For the June 30, 2014 valuation and later, the updated Society of Actuaries' Healthcare Cost Trend Model is used to project medical and prescription drug costs. This model estimates trend amounts that are projected out for 80 years. The model has been populated with assumptions that are specific to the State of Alaska.

Aging Factors

Age	Medical	Prescription Drugs
0 – 44	2.0%	4.5%
45 – 54	2.5%	3.5%
55 – 64	2.5%	1.5%
65 – 74	3.0%	2.0%
75 – 84	2.0%	-0.5%
85 – 94	0.3%	-2.5%
95+	0.0%	0.0%

Retired Member Contributions for Medical Benefits

Currently contributions are required for TRS members who are under age 60 and have less than 25 years of service. Eligible Tier 1 members are exempt from contribution requirements. Annual FY21 contributions based on monthly rates shown below for calendar 2021 are assumed based on the coverage category for current retirees. The composite rate shown is used for current active and inactive members in Tier 2 who are assumed to retire prior to age 60 with less than 25 years of service and who are not disabled. For dependent children, we value 1/3 of the annual retiree contribution to estimate the per child rate based upon the assumed number of children in rates where children are covered.

Coverage Category	Α	ndar 2021 nnual tribution	Мо	dar 2021 onthly ribution	Мо	dar 2020 Inthly ribution
Retiree Only	\$	8,448	\$	704	\$	741
Retiree and Spouse	\$	16,896	\$	1,408	\$	1,482
Retiree and Child(ren)	\$	11,940	\$	995	\$	1,047
Retiree and Family	\$	20,388	\$	1,699	\$	1,788
Composite	\$	12,552	\$	1,046	\$	1,101

Trend Rate for Retired Member Medical Contributions

The table below shows the rate used to project the retired member medical contributions from the shown fiscal year to the next fiscal year. For example, 0.0% is applied to the FY21 retired member medical contributions to get the FY22 retired member medical contributions.

Trend Assumptions					
FY21	0.0%				
FY22	0.0%				
FY23+	4.0%				

Graded trend rates for retired member medical contributions are consistent with the rates used for the June 30, 2019 valuation. Actual FY21 retired member medical contributions are reflected in the valuation.

Healthcare Participation

100% of system paid members and their spouses are assumed to elect healthcare benefits as soon as they are eligible. 20% of non-system paid members and their spouses are assumed to elect healthcare benefits as soon as they are eligible.

Changes in Assumptions Since the Prior Valuation

Healthcare claim costs are updated annually as described in Section 5.2. Retired member contributions were updated to reflect the 5% decrease from CY20 to CY21. The amounts included in the Normal Cost for administrative expenses were changed from \$3,034,000 to \$3,003,000 for pension and from \$1,439,000 to \$1,362,000 for healthcare (based on the most recent two years of actual administrative expenses paid from plan assets).

Table 1: Salary Scale

Years of Service	Percent Increase
0	6.75%
1	6.25%
2	5.75%
3	5.25%
4	4.75%
5	4.25%
6	3.75%
7	3.65%
8	3.55%
9	3.45%
10	3.35%
11	3.25%
12	3.15%
13	3.05%
14	2.95%
15	2.85%
16+	2.75%

Table 2: Turnover Rates

Select Rates during the First 8 Years of Employment

Years of Service	Male	Female
0	20.40%	17.00%
1	20.40%	17.00%
2	16.80%	14.00%
3	14.40%	12.00%
4	12.00%	10.00%
5	10.80%	9.00%
6	9.00%	7.50%
7	7.20%	6.00%

Ultimate Rates after the First 8 Years of Employment

Age	Male	Female	Age	Male	Female
22	2.62%	3.79%	39	2.57%	3.74%
23	2.62%	3.79%	40	2.26%	2.75%
24	2.61%	3.79%	41	2.26%	2.75%
25	2.61%	3.79%	42	2.25%	2.74%
26	2.61%	3.79%	43	2.24%	2.73%
27	2.60%	3.79%	44	2.23%	2.73%
28	2.60%	4.27%	45	2.22%	2.72%
29	2.60%	4.76%	46	2.21%	2.71%
30	2.60%	5.24%	47	2.20%	2.70%
31	2.60%	5.73%	48	2.18%	2.69%
32	2.59%	6.22%	49	2.16%	2.68%
33	2.59%	5.72%	50	3.43%	4.42%
34	2.59%	5.23%	51	3.39%	4.39%
35	2.59%	4.74%	52	3.35%	4.36%
36	2.58%	4.25%	53	3.30%	4.32%
37	2.58%	3.75%	54	3.00%	7.56%
38	2.58%	3.75%	55+	2.00%	5.00%

Table 3: Disability Rates

Age	Male	Female
< 31	0.0337%	0.0612%
31	0.0337%	0.0613%
32	0.0337%	0.0613%
33	0.0342%	0.0622%
34	0.0347%	0.0631%
35	0.0353%	0.0641%
36	0.0357%	0.0650%
37	0.0362%	0.0659%
38	0.0371%	0.0674%
39	0.0379%	0.0689%
40	0.0387%	0.0703%
41	0.0395%	0.0718%
42	0.0403%	0.0733%
43	0.0423%	0.0770%
44	0.0443%	0.0806%
45	0.0464%	0.0843%
46	0.0483%	0.0879%
47	0.0504%	0.0916%
48	0.0536%	0.0975%
49	0.0569%	0.1034%
50	0.0601%	0.1093%
51	0.0634%	0.1152%
52	0.0666%	0.1211%
53	0.0746%	0.1356%
54	0.0826%	0.1501%

Table 4: Retirement Rates

	Reduced L					
Age	Male	Female	Male	Female		
< 45	N/A	N/A	3.0%	3.0%		
45	N/A	N/A	5.0%	5.0%		
46	N/A	N/A	5.0%	8.0%		
47	N/A	N/A	5.0%	8.0%		
48	N/A	N/A	5.0%	8.0%		
49	N/A	N/A	5.0%	8.0%		
50	10.0%	10.0%	5.0%	14.0%		
51	10.0%	10.0%	8.0%	13.0%		
52	10.0%	10.0%	15.0%	13.0%		
53	10.0%	12.0%	15.0%	14.0%		
54	10.0%	12.0%	15.0%	15.0%		
55	15.0%	8.0%	20.0%	17.0%		
56	10.0%	8.0%	17.0%	17.0%		
57	10.0%	8.0%	15.0%	17.0%		
58	10.0%	8.0%	20.0%	17.0%		
59	10.0%	8.0%	20.0%	23.0%		
60	N/A	N/A	25.0%	23.0%		
61	N/A	N/A	18.0%	23.0%		
62	N/A	N/A	18.0%	21.0%		
63	N/A	N/A	18.0%	21.0%		
64	N/A	N/A	18.0%	26.0%		
65	N/A	N/A	30.0%	21.0%		
66	N/A	N/A	25.0%	21.0%		
67	N/A	N/A	25.0%	21.0%		
68	N/A	N/A	25.0%	26.0%		
69	N/A	N/A	35.0%	26.0%		
70	N/A	N/A	30.0%	26.0%		
71	N/A	N/A	30.0%	37.0%		
72	N/A	N/A	30.0%	37.0%		
73	N/A	N/A	30.0%	37.0%		
74	N/A	N/A	30.0%	37.0%		
75 - 79	N/A	N/A	50.0%	50.0%		
80+	N/A	N/A	100.0%	100.0%		

Section 6: Actuarial Standard of Practice No. 51

Funding future retirement benefits prior to when those benefits become due involves assumptions regarding future economic and demographic experience. These assumptions are applied to calculate actuarial liabilities, current contribution requirements, and the funded status of the plan. However, to the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the plan. Understanding the risks to the funding of the plan is important.

Actuarial Standard of Practice No. 51 (ASOP 51)¹ requires certain disclosures of potential risks to the plan and provides useful information for intended users of actuarial reports that determine plan contributions or evaluate the adequacy of specified contribution levels to support benefit provisions.

Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

It is important to note that not all risk is negative, but all risk should be understood and accepted based on knowledge, judgement, and educated decisions. Future measurements may deviate in ways that produce positive or negative financial impacts to the plan.

In the actuary's professional judgment, the following risks may reasonably be anticipated to significantly affect the pension plan's future financial condition and contribution requirements.

- Investment Risk potential that the investment return will be different than the 7.38% expected in the
 actuarial valuation
- Contribution Risk potential that the contribution actually made will be different than the actuarially determined contribution
- Long-Term Return on Investment Risk potential that changes in long-term capital market assumptions or the plan's asset allocation will create the need to update the long-term return on investment assumption
- Longevity Risk potential that participants live longer than expected compared to the valuation mortality assumptions
- Salary Increase Risk potential that future salaries will be different than expected in the actuarial valuation
- Inflation Risk potential that the consumer price index (CPI) for urban wage earners and clerical workers for Anchorage is different than the 2.5% assumed in the valuation
- Other Demographic Risk potential that other demographic experience will be different than expected

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the plan. **This list is not all-inclusive**; it is an attempt to identify the more significant risks and how those risks might affect the results shown in this report.

Note that ASOP 51 does not require the actuary to evaluate the ability or willingness of the plan sponsor to make contributions to the plan when due, or to assess the likelihood or consequences of potential future changes in law. In addition, this valuation report is not intended to provide investment advice or to provide guidance on the management or reduction of risk.

ASOP 51 does not apply to the healthcare portion of the plan. Accordingly, all figures in this section relate to the pension portion.

Assessment of Risks

Investment Risk

Plan costs are very sensitive to the market return.

- Any return on assets lower than assumed will increase costs.
- The plan uses an actuarial value of assets that smooths gains and losses on market returns over a five-year period to help control some of the volatility in costs due to investment risk.
- Historical experience of actual returns is shown in Section 2.4 of this report. This historical experience illustrates how returns can vary over time.

Contribution Risk

There is a risk to the plan when the employer's and/or State's actual contribution amount and the actuarially determined contribution differ.

- If the actual contribution is lower than the actuarially determined contribution, the plan may not be sustainable in the long term.
- Any underpayment of the contribution will increase future contribution amounts to help pay off the additional Unfunded Actuarial Accrued Liability associated with the underpayment(s).
- As long as the Board consistently adopts the actuarially determined contributions, this risk is mitigated
 due to Alaska statutes requiring the State to contribute additional funds necessary to pay the total
 contributions adopted by the Board.

Long-Term Return on Investment Risk

Inherent in the long-term return on investment assumption is the expectation that the current rate will be used until the last benefit payment of the plan is made. There is a risk that sustained changes in economic conditions, changes in long-term future capital market assumptions, or changes to the plan's asset allocation will necessitate an update to the long-term return on investment assumption used.

- Under a lower long-term return on investment assumption, less investment return is available to pay plan benefits. This may lead to a need for increased employer contributions.
- The liabilities will be higher at a lower assumed rate of return because future benefits will have a lower discount rate applied when calculating the present value.
- A 1% decrease in the long-term return on investment assumption will increase actuarial accrued liability by approximately 11%.
- This risk may be increased due to the plan being closed to new entrants. As the plan continues to
 mature, the magnitude of negative cash flow discussed in the Plan Maturity Measures later in this
 section will grow, thereby creating a need for more liquid assets that may not garner the same longterm return as currently assumed.

Longevity Risk

Plan costs will be increased as participants are expected to live longer.

- Benefits are paid over a longer lifetime when life expectancy is expected to increase. The longer duration of payments leads to higher liabilities.
- Health care has been improving, which affects the life expectancy of participants. As health care improves, leading to longer life expectancies, costs to the plan could increase.

- The mortality assumption for the plan mitigates this risk by assuming future improvement in mortality. However, any improvement in future mortality greater than that expected by the current mortality assumption would lead to increased costs for the plan.
- The Postretirement Pension Adjustments and Alaska Cost-of-Living Allowance increase longevity risk because members who live longer than expected will incur more benefit payment increases than expected and therefore increase costs.

Salary Increase Risk

Plan costs will be increased if actual salary increases are larger than expected.

- Higher-than-expected salary increases will produce higher benefits.
- The higher benefits may be partially offset by increased employee contributions due to higher salaries.
- If future payroll grows at a rate different than assumed, contributions as a percentage of payroll will be affected.

Inflation Risk

Plan costs will be increased if the actual CPI for Anchorage is greater than the 2.5% assumed in the valuation.

- Retirement benefits will be greater than expected if the CPI is greater than the assumed rate, which will increase costs.
- This risk is mitigated by the 75% and 50% of CPI provisions and the 9% and 6% maximums.
- This risk is also mitigated by the age and time in payment requirements to receive an increase.
- Inflation risk may be associated with the interaction of inflation with other assumptions, but this is not significant as a standalone assumption, and therefore is considered as part of the associated assumption risk instead of being discussed here.

Other Demographic Risk

The plan is subject to risks associated with other demographic assumptions (e.g., retirement, termination, and retired members remaining in Alaska assumptions). Differences between actual and expected experience for these assumptions tend to have less impact on the overall costs of the plan. The demographic assumptions used in the valuation are re-evaluated regularly as part of the four-year experience studies to ensure the assumptions are consistent with long-term expectations.

Historical Information

Monitoring certain information over time may help understand risks faced by the plan. Historical information is included throughout this report. Some examples are:

- Funded Ratio History shown in the Executive Summary illustrates how the plan's funded status (comparison of actuarial accrued liabilities to actuarial value of assets) has changed over time.
- Section 1.6 shows historical analysis of financial experience including how contribution rates have changed over time.
- Section 2.4 shows the volatility of asset returns over time.
- Section 4 includes various historical information showing how member census data has changed over time.

Plan Maturity Measures

There are certain measures that may aid in understanding the significant risks to the plan.

Ratio of Retired Liability to Total Liability (\$'s in \$000's)		June 30, 2019		June 30, 2020		
1.	Retiree and Beneficiary Accrued Liability	\$	5,495,907	\$	5,570,625	
2.	Total Accrued Liability	\$	7,388,020	\$	7,447,036	
3.	Ratio, (1) ÷ (2)		74.4%		74.8%	

A high percentage of liability concentrated on participants in pay status indicates a mature plan (often a ratio above 60% - 65%). Because the plan was closed to new entrants in 2006, we expect the percentage in item #3 to continue to increase over time. An increasing percentage may indicate a need for a less risky asset allocation, which may lead to a lower long-term return on asset assumption and increased costs. Higher percentages may also indicate greater investment risk as benefit payments may be greater than contributions creating an increased reliance on investment returns. This ratio should be monitored each year in the future.

Ratio of Cash Flow to Assets (\$'s in \$000's)		FYE June 30, 2019		FYE June 30, 2020		
1.	Contributions	\$	199,933	\$	207,899	
2.	Benefit Payments	_	472,717	_	490,447	
3.	Cash Flow, (1) - (2)	\$	(272,784)	\$	(282,548)	
4.	Fair Value of Assets	\$	5,511,929	\$	5,444,799	
5.	Ratio, (3) ÷ (4)		(4.9%)		(5.2%)	

When this cash flow ratio is negative, more cash is being paid out than deposited in the trust. Negative cash flow indicates the trust needs to rely on investment returns to cover benefit payments and / or may need to invest in more liquid assets to cover the benefit payments. More liquid assets may not generate the same returns as less liquid assets, which can increase the investment risk. Currently, the low magnitude of the ratio implies there may already be enough liquid assets to cover the benefit payments, less investment return is needed to cover the shortfall, or only a small portion of assets will need to be converted to cash. Therefore, the investment risk is likely not amplified at this time. However, due to the plan being closed, we expect this measure to become increasingly negative over time. This maturity measure should be monitored in the future.

Contribution Volatility (\$'s in \$000's)	June 30, 2019	June 30, 2020		
1. Fair Value of Assets	\$ 5,511,929	\$ 5,444,799		
2. DB/DCR Payroll	\$ 725,659	\$ 741,090		
3. Asset to Payroll Ratio, (1) ÷ (2)	759.6%	734.7%		
4. Accrued Liability	\$ 7,388,020	\$ 7,447,036		
5. Liability to Payroll Ratio, (4) ÷ (2)	1,018.1%	1,004.9%		

Plans that have higher asset-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to investment return. For example, a plan with an asset-to-payroll ratio of 10% may experience twice the contribution volatility due to investment return volatility than a plan with an asset-to-payroll ratio of 5%. Plans that have higher liability-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to changes in liability. For example, if an assumption change increases the liability of two plans by the same percent, the plan with a liability-to-payroll ratio of 10% may experience twice the contribution volatility than a plan with a liability-to-payroll ratio of 5%.

Glossary of Terms

Actuarial Accrued Liability

Total accumulated cost to fund pension or postemployment benefits arising from service in all prior years.

Actuarial Cost Method

Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension or postemployment plan for a group of plan members to the years of service that give rise to that cost.

Actuarial Present Value of Projected Benefits

Amount which, together with future interest, is expected to be sufficient to pay all future benefits.

Actuarial Valuation

Study of probable amounts of future pension or postemployment benefits and the necessary amount of contributions to fund those benefits.

Actuary

Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.

GASB 67 and 68

Governmental Accounting Standards Board Statement Number 67 amends Number 25 effective for the fiscal year beginning after June 15, 2013 and defines new financial reporting requirements for public pension plans.

Governmental Accounting Standards Board Statement Number 68 amends Number 27 effective for fiscal years beginning after June 15, 2014 and defines new accounting and financial reporting requirements for employers sponsoring public pension plans.

GASB 74 and 75

Governmental Accounting Standards Board Statement Number 74 amends Number 43 effective for the fiscal year beginning after June 15, 2016 and defines new financial reporting requirements for public postemployment benefit plans. Governmental Accounting Standards Board Statement Number 75 amends Number 45 effective for fiscal years beginning after June 15, 2017 and defines new accounting and financial reporting requirements for employers sponsoring public postemployment benefit plans.

Normal Cost

That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.

Rate Payroll

Members' earnings used to determine contribution rates.

Unfunded Actuarial Accrued Liability (UAAL)

The portion of the actuarial accrued liability not offset by plan assets.

Valuation Payroll

Members' earnings used to determine Normal Cost and Actuarial Accrued Liability.

Vested Benefits

Benefits which are unconditionally guaranteed regardless of employment.



State of Alaska

Teachers'
Retirement System
Defined Contribution
Retirement Plan

For Occupational Death and Disability and Retiree Medical Benefits

Actuarial Valuation Report As of June 30, 2020

May 2021



May 20, 2021

State of Alaska
The Alaska Retirement Management Board
The Department of Revenue, Treasury Division
The Department of Administration, Division of Retirement and Benefits
P.O. Box 110203
Juneau, AK 99811-0203

Certification of Actuarial Valuation

Dear Members of The Alaska Retirement Management Board, The Department of Revenue and The Department of Administration:

This report summarizes the annual actuarial valuation results of the State of Alaska Teachers' Retirement System Defined Contribution Retirement (TRS DCR) Plan as of June 30, 2020 performed by Buck Global, LLC (Buck). This report is an update to the draft report dated January 7, 2021, reflecting minor wording changes.

The actuarial valuation is based on financial information provided in the financial statements audited by KPMG LLP, member data provided by the Division of Retirement and Benefits, and medical enrollment data provided by the healthcare claims administrator (Aetna), as summarized in this report. The benefits considered are those delineated in Alaska statutes effective June 30, 2020. The actuary did not verify the data submitted, but did perform tests for consistency and reasonableness.

All costs, liabilities and other factors under TRS DCR were determined in accordance with generally accepted actuarial principles and procedures. An actuarial cost method is used to measure the actuarial liabilities which we believe is reasonable. Buck is solely responsible for the actuarial data and actuarial results presented in this report. This report fully and fairly discloses the actuarial position of TRS DCR as of June 30, 2020.

TRS DCR is funded by Employer Contributions in accordance with the funding policy adopted by the Alaska Retirement Management Board (Board). The funding objective for TRS DCR is to pay required contributions that remain level as a percent of TRS DCR compensation. The Board has also established a funding policy objective that the required contributions be sufficient to pay the Normal Costs of active plan members, plan expenses, and amortize the Unfunded Actuarial Accrued Liability as a level percent of TRS DCR compensation over closed layered 25-year periods. This objective is currently being met and is projected to continue to be met as required by the Alaska State statutes. Absent future gains/losses, actuarially determined contributions are expected to remain level as a percent of pay and the overall funded status is expected to remain at or above 100%.

The Board and staff of the State of Alaska may use this report for the review of the operations of TRS DCR. Use of this report, for any other purpose or by anyone other than the Board or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, you should ask Buck to

review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without the review by Buck.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. In particular, retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the plan and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience under the plan. The actuary performs an analysis of plan experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience. The last full experience analysis was performed for the period July 1, 2013 to June 30, 2017. Based on that experience study, the Board adopted new assumptions effective beginning with the June 30, 2018 valuation to better reflect expected future experience. Based on our annual analysis of recent claims experience, changes were made to the per capita claims cost rates effective June 30, 2020 to better reflect expected future healthcare experience. A summary of the actuarial assumptions and methods used in this actuarial valuation is shown in Sections 4.2 and 4.3. We certify that the assumptions and methods described in Sections 4.2 and 4.3 of this report meet the requirements of all applicable Actuarial Standards of Practice.

Governmental Accounting Standards Board (GASB) Statement No. 74 (GASB 74) was effective for TRS DCR beginning with fiscal year ending June 30, 2017, and GASB 75 was effective beginning with fiscal year ending June 30, 2018. Separate GASB 74 and GASB 75 reports have been prepared.

Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) applies to actuaries performing funding calculations related to a pension plan. ASOP 51 does not apply to actuaries performing services in connection with other post-employment benefits, such as medical benefits. Accordingly, ASOP 51 does not apply to the retiree medical portion of TRS DCR. We also believe ASOP 51 does not apply to the occupational death and disability portion of TRS DCR. Therefore, information related to ASOP 51 is not included in this report. However, it may be beneficial to review the ASOP 51 information provided in the TRS valuation report for information on risks that may also relate to the occupational death and disability benefits provided by this plan.

Use of Models

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to an internally developed model that applies applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other

funding outputs and the internal model are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal model, extra checking and review are completed. Significant changes to the internal model that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

Buck used manual rate models to determine relative plan values for the defined benefit (DB) retiree medical plan and the DCR retiree medical plan, and to reflect the different Medicare coordination methods between the two plans. The manual rate models are intended to provide benchmark data and pricing capabilities, calculate per capita costs, and calculate actuarial values of different commercial health plans. Buck relied on the models, which were developed using industry data by actuaries and consultants at OptumInsight.

COVID-19

The potential impact of the ongoing COVID-19 pandemic on costs and liabilities was considered and an adjustment was made in setting the medical per capita claims cost assumption. FY20 medical claims were adjusted for a COVID-19 related decline in claims during the last four months (March – June) of FY20. A more detailed explanation on these adjustments is shown in Sections 4.2 and 4.3 and in the valuation report for the DB plan.

This report was prepared under my supervision and in accordance with all applicable Actuarial Standards of Practice. I am a Fellow of the Society of Actuaries, an Enrolled Actuary, a Fellow of the Conference of Consulting Actuaries, and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

I am available to discuss this report with you at your convenience. I can be reached at 602-803-6174.

Respectfully submitted,

II KI

David J. Kershner, FSA, EA, MAAA, FCA

Principal Buck

The undersigned actuary is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms his qualification to render opinions in such matters in accordance with the Qualification Standards of the American Academy of Actuaries.

Scott Young, FSA, EA, MAAA, FCA

Scott Young

Director Buck

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Executive Summary

Overview

The State of Alaska Teachers' Retirement System Defined Contribution Retirement (TRS DCR) Plan provides occupational death & disability and retiree medical benefits to teachers and other eligible members hired after June 30, 2006 or who have elected participation in this plan. The Commissioner of the Department of Administration is responsible for administering the plan. The Alaska Retirement Management Board has fiduciary responsibility over the assets of the plan. This report presents the results of the actuarial valuation of TRS DCR as of the valuation date of June 30, 2020.

Purpose

An actuarial valuation is performed on the plan annually as of the end of the fiscal year. The main purposes of the actuarial valuation detailed in this report are:

- 1. To determine the Employer contribution necessary to meet the Board's funding policy for the plan;
- 2. To disclose the funding assets and liability measures as of the valuation date;
- 3. To review the current funded status of the plan and assess the funded status as an appropriate measure for determining actuarially determined contributions;
- 4. To compare actual and expected experience under the plan during the last fiscal year; and
- 5. To report trends in contributions, assets, liabilities, and funded status over the last several years.

The actuarial valuation provides a "snapshot" of the funded position of TRS DCR based on the plan provisions, membership data, assets, and actuarial methods and assumptions as of the valuation date.

Funded Status

Where presented, references to "funded ratio" and "unfunded actuarial accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

Fund	Funded Status as of June 30 (\$'s in 000's)		2019		2020	
Occi	upational Death & Disability					
a.	Actuarial Accrued Liability	\$	240	\$	223	
b.	Valuation Assets		4,359		4,933	
C.	Unfunded Actuarial Accrued Liability, (a) - (b)	\$	(4,119)	\$	(4,710)	
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	1	,816.3%	2	2,212.1%	
e.	Fair Value of Assets	\$	4,328	\$	4,823	
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	1	,803.3%	2	2,162.8%	

1

Fund	ed Status as of June 30 (\$'s in 000's)	2019	2020
Retir	ee Medical		
a.	Actuarial Accrued Liability	\$ 32,981	\$ 40,634
b.	Valuation Assets	 42,307	 49,554
C.	Unfunded Actuarial Accrued Liability, (a) - (b)	\$ (9,326)	\$ (8,920)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	128.3%	122.0%
e.	Fair Value of Assets	\$ 42,067	\$ 48,413
f.	Funded Ratio based on Fair Value of Assets, (e) \div (a)	127.5%	119.1%
Total			
a.	Actuarial Accrued Liability	\$ 33,221	\$ 40,857
b.	Valuation Assets	 46,666	 54,487
C.	Unfunded Actuarial Accrued Liability, (a) - (b)	\$ (13,445)	\$ (13,630)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	140.5%	133.4%
e.	Fair Value of Assets	\$ 46,395	\$ 53,236
f.	Funded Ratio based on Fair Value of Assets, (e) \div (a)	139.7%	130.3%

The key reasons for the change in the funded status are explained below. The funded status for healthcare benefits is not necessarily an appropriate measure to confirm that assets are sufficient to settle health plan obligations as there are no available financial instruments for purchase. Future experience is likely to vary from assumptions, so there is potential for actuarial gains or losses.

1. Investment Experience

The approximate FY20 investment return based on fair value of assets was 4.3% compared to the expected investment return of 7.38% (net of investment expenses of approximately 0.30%). This resulted in a loss of approximately \$1,507,000 to the plan from investment experience. The asset valuation method recognizes 20 percent of this loss (\$301,000) this year and an additional 20 percent in each of the next 4 years. In addition, 20 percent of the FY16 investment loss, 20 percent of the FY17 investment gain, 20 percent of the FY18 investment loss, and 20 percent of the FY19 investment loss were recognized this year. The approximate FY20 asset return based on actuarial value of assets was 6.3% compared to the expected asset return of 7.38% (net of investment expenses).

2. Salary Increases

Salary increases for continuing active members during FY20 were slightly more than anticipated based on the valuation assumptions, resulting in a very small liability loss (less than \$1,000).

3. Demographic Experience

The number of active members increased 6.7% from 4,998 at June 30, 2019 to 5,332 at June 30, 2020. The average age of active members increased from 41.06 to 41.63 and average credited service increased from 5.67 to 6.03 years.

The demographic experience gains/losses are shown on page 4.

4. Retiree Medical Claims Experience

Please refer to the State of Alaska Teachers' Retirement System (TRS) Defined Benefit Plan Actuarial Valuation Report as of June 30, 2020 for a full description of the assumptions and costs of the retiree medical plan. Adjustments to these costs and assumptions are described in this report.

The recent claims experience described in Section 4.2 of this report (Section 5.2 of the TRS report) created an actuarial gain of approximately \$2,162,000. This gain included an update to the medical and prescription drug relative value factors (described in Section 4.1) this year. In addition, the 0.2% annual trend rate adjustment factor between the DB and DCR plans was removed, which resulted in an actuarial loss of approximately \$2,153,000.

5. Changes in Methods Since the Prior Valuation

There were no changes in actuarial methods since the prior valuation.

6. Changes in Assumptions Since the Prior Valuation

Healthcare claim costs are updated annually as described in Section 4.2. The medical and prescription drug relative value factors were updated this year. In addition, the 0.2% annual trend rate adjustment factor between the DB and DCR plans was removed. The amount included in Normal Cost for administrative expenses for retiree medical was updated based on the last two years of actual administrative expenses paid from plan assets. There were no other changes in actuarial assumptions since the prior valuation.

7. Changes in Benefit Provisions Since the Prior Valuation

There have been no changes in benefit provisions valued since the prior valuation.

Comparative Summary of Contribution Rates

Occu	pational Death & Disability	FY 2022	FY 2023
a.	Employer Normal Cost Rate	0.08%	0.08%
b.	Past Service Cost Rate	(0.09)%	(0.10)%
C.	Total Employer Contribution Rate, (a) + (b), not less than (a)	0.08%	0.08%
Retir	ee Medical	FY 2022	FY 2023
a.	Employer Normal Cost Rate	0.83%	0.87%
b.	Past Service Cost Rate	<u>(0.15)%</u>	(0.14)%
C.	Total Employer Contribution Rate, (a) + (b), not less than (a)	0.83%	0.87%
Total		FY 2022	FY 2023
a.	Employer Normal Cost Rate	0.91%	0.95%
b.	Past Service Cost Rate	(0.24)%	(0.24)%
c.	Total Employer Contribution Rate, (a) + (b), not less than (a)	0.91%	0.95%

The exhibit below shows the historical Board-adopted employer contribution rates for TRS DCR.

	Total Employer Contribution Rate							
Valuation Date	Fiscal Year	Occupational Death & Disability	Retiree Medical	Total				
June 30, 2008	FY11	0.28%	0.68%	0.96%				
June 30, 2009	FY12	0.00%	0.58%	0.58%				
June 30, 2010	FY13	0.00%	0.49%	0.49%				
June 30, 2011	FY14	0.00%	0.47%	0.47%				
June 30, 2012	FY15	0.00%	2.04%	2.04%				
June 30, 2013	FY16	0.00%	2.04%	2.04%				
June 30, 2014	FY17	0.00%	1.05%	1.05%				
June 30, 2015	FY18	0.00%	0.91%	0.91%				
June 30, 2016	FY19	0.08%	0.79%	0.87%				
June 30, 2017	FY20	0.08%	1.09%	1.17%				
June 30, 2018	FY21	0.08%	0.93%	1.01%				
June 30, 2019	FY22	0.08%	0.83%	0.91%				
June 30, 2020	FY23	TBD	TBD	TBD				

Summary of Actuarial Accrued Liability Gain/(Loss)

The following table shows the FY20 gain/(loss) on actuarial accrued liability as of June 30, 2020 (\$'s in 000's):

0	ccupational Death & Disability		Retiree Medical		Total
\$	0	\$	240	\$	240
	(4)		744		740
	199		(21)		178
	111		(43)		68
	(1)		(7)		(8)
	0		N/A		0
	0		(495)		(495)
	1		(2,314)		(2,313)
	N/A		2,162		2,162
	N/A		(2,153)		(2,153)
	9		<u>(151)</u>		(142)
\$	315	\$	(2,038)	\$	(1,723)
	\$	\$ 0 (4) 199 111 (1) 0 0 1 N/A N/A 9	Death & Disability \$ 0 \$ (4)	Death & Disability Retiree Medical \$ 0 \$ 240 (4) 744 199 (21) 111 (43) (1) (7) 0 N/A 0 (495) 1 (2,314) N/A 2,162 N/A (2,153) 9 (151)	Death & Disability Retiree Medical \$ 0 \$ 240 \$ (4) 744 199 (21) 111 (43) (1) (7) 0 N/A 0 (495) 1 (2,314) N/A 2,162 N/A (2,153) 9 (151)

¹ Includes the estimated impact of COVID-19 on claims experience during FY20.

² Includes the effects of various data changes that are typical when new census data is received for the annual valuation, the effects of the differences between expected and actual benefit payments, and other items that do not fit neatly into any of the other categories.

Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost (\$'s in 000's)

As of June 30, 2020	ent Value of cted Benefits	(Past Service) Liability		
Active Members				
Occupational Death Benefits	\$ 789	\$	85	
Occupational Disability Benefits	1,312		(58)	
Medical and Prescription Drug Benefits	77,331		49,213	
Medicare Part D Subsidy	 (14,935)		(9,504)	
Subtotal	\$ 64,497	\$	39,736	
Benefit Recipients				
Survivor Benefits	\$ 0	\$	0	
Disability Benefits	196		196	
Medical and Prescription Drug Benefits	1,145		1,145	
Medicare Part D Subsidy	 (220)		(220)	
Subtotal	\$ 1,121	\$	1,121	
Total	\$ 65,618	\$	40,857	
Total Occupational Death & Disability	\$ 2,297	\$	223	
Total Retiree Medical, Net of Part D Subsidy	\$ 63,321	\$	40,634	
Total Retiree Medical, Gross of Part D Subsidy	\$ 78,476	\$	50,358	
As of June 30, 2020		Nor	mal Cost	
Active Members				
Occupational Death Benefits		\$	111	
Occupational Disability Benefits			201	
Medicar Port P. Subsidu			4,199	
Medicare Part D Subsidy Subtotal		\$	(811 <u>)</u> 3,700	
		,	-,	
Administrative Expense Load		_		
Occupational Death & Disability		\$	0	
Retiree Medical Subtotal		\$	<u>8</u> 8	
Custotal		Ψ	o o	
Total		\$	3,708	
Total Occupational Death & Disability		\$	312	
Total Retiree Medical, Net of Part D Subsidy		\$	3,396	
Total Retiree Medical, Gross of Part D Subsidy		\$	4,207	

Actuarial Accrued

Section 1.2: Actuarial Contributions as of June 30, 2020 for FY23 (\$'s in 000's)

Normal Cost Rate	cupational Death & Disability	Retiree Medical	Total		
1. Total Normal Cost	\$ 312	\$ 3,396	\$	3,708	
2. DCR Plan Rate Payroll Projected for FY21	391,854	391,854		391,854	
3. Employer Normal Cost Rate, (1) ÷ (2)	0.08%	0.87%		0.95%	
Past Service Cost Rate					
Actuarial Accrued Liability	\$ 223	\$ 40,634	\$	40,857	
2. Valuation Assets	 4,933	 49,554		54,487	
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$ (4,710)	\$ (8,920)	\$	(13,630)	
4. Funded Ratio based on Valuation Assets	2,212.1%	122.0%		133.4%	
5. Past Service Cost Amortization Payment	(376)	(533)		(909)	
6. DCR Plan Rate Payroll Projected for FY21	391,854	391,854		391,854	
7. Past Service Cost Rate, (5) ÷ (6)	(0.10%)	(0.14%)		(0.24%)	
Total Employer Contribution Rate, not less than Normal Cost Rate	0.08%	0.87%		0.95%	

The table below shows the total employer contribution rate based on total DB and DCR Plan payroll for informational purposes.

Total Employer Contribution Rate as Percent of Total Payroll	De	ipational eath & sability	Retiree Medical	Total		
1. Total Normal Cost	\$	312	\$ 3,396	\$	3,708	
Total DB and DCR Plan Rate Payroll Projected for FY21		741,091	741,091		741,091	
3. Employer Normal Cost Rate, (1) ÷ (2)		0.04%	0.46%		0.50%	
4. Past Service Cost Amortization Payment		(376)	(533)		(909)	
5. Past Service Cost Rate, (4) ÷ (2)		(0.05%)	(0.07%)		(0.12%)	
Total Employer Contribution Rate, not less than Normal Cost Rate		0.04%	0.46%		0.50%	

Schedule of Past Service Cost Amortizations - Occupational Death & Disability (\$'s in 000's)

	Amortization Period		Bal			
Layer	Date Created	Years Remaining	Initial	Ou	tstanding	jinning-of- r Payment
Initial Unfunded Liability	06/30/2007	12	\$ 16	\$	15	\$ 2
FY08 Gain	06/30/2008	13	(392)		(380)	(38)
Change in Assumptions	06/30/2009	14	(82)		(81)	(8)
FY09 Gain	06/30/2009	14	(594)		(592)	(55)
Change in Assumptions	06/30/2010	15	(7)		(8)	(1)
FY10 Gain	06/30/2010	15	(479)		(483)	(43)
FY11 Gain	06/30/2011	16	(560)		(570)	(49)
FY12 Gain	06/30/2012	17	(129)		(133)	(11)
FY13 Gain	06/30/2013	18	(149)		(152)	(12)
Change in Assumptions	06/30/2014	19	(50)		(53)	(4)
PRPA Modification	06/30/2014	19	(25)		(25)	(2)
FY14 Gain	06/30/2014	19	(255)		(262)	(20)
FY15 Gain	06/30/2015	20	(275)		(282)	(21)
FY16 Gain	06/30/2016	21	(209)		(215)	(15)
FY17 Gain	06/30/2017	22	(251)		(254)	(18)
Change in Assumptions ¹	06/30/2018	23	0		0	0
FY18 Gain	06/30/2018	23	(257)		(259)	(18)
FY19 Gain	06/30/2019	24	(338)		(339)	(22)
FY20 Gain	06/30/2020	25	(637)		(637)	(41)
Total				\$	(4,710)	\$ (376)

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¹ The net effect of changing assumptions was less than \$1,000.

Schedule of Past Service Cost Amortizations - Retiree Medical (\$'s in 000's)

	Amortizat	Amortization Period			lances		
Layer	Date Created	Years Remaining		Initial	Outstanding	Beginning Year Paym	
Initial Unfunded Liability	06/30/2007	12	\$	(239)	\$ (230)	\$ (2	4)
Change in Assumptions	06/30/2008	13		84	86		9
FY08 Gain	06/30/2008	13		(393)	(380)	(3	8)
Change in Assumptions	06/30/2009	14		(69)	(67)	((6)
FY09 Gain	06/30/2009	14		(281)	(281)	(2	(6)
Change in Assumptions ¹	06/30/2010	15		0	0		0
FY10 Gain	06/30/2010	15		(545)	(549)	(4	9)
FY11 Gain	06/30/2011	16		(94)	(94)	((8)
Change in Assumptions	06/30/2012	17		11,518	11,819	96	6
FY12 Gain	06/30/2012	17		(60)	(58)	((5)
FY13 Loss	06/30/2013	18		3,439	3,544	27	9
Change in Assumptions	06/30/2014	19		(9,736)	(10,029)	(76	2)
FY14 Loss	06/30/2014	19		1,616	1,663	12	:6
FY15 Gain	06/30/2015	20		(3,485)	(3,581)	(26	4)
EGWP Impact	06/30/2016	21		(6,400)	(6,547)	(46	(8)
FY16 Loss	06/30/2016	21		958	983	7	0
Change in Assumptions	06/30/2017	22		7,645	7,768	54	.0
FY17 Gain	06/30/2017	22		(1,451)	(1,474)	(10	2)
Change in Assumptions/Methods	06/30/2018	23		(9,505)	(9,574)	(64	8)
FY18 Loss	06/30/2018	23		2,491	2,509	17	0
FY19 Gain	06/30/2019	24		(4,904)	(4,926)	(32	:5)
Change in Assumptions	06/30/2020	25		2,153	2,153	13	9
FY20 Gain	06/30/2020	25		(1,655)	(1,655)	(10	7)
Total					\$ (8,920)	\$ (53	3)

¹ The net effect of changing assumptions was less than \$1,000. The demographic assumption changes decreased liability by \$133,000 and the economic assumptions changes increased the liability by \$133,000. Therefore, the net effect of all assumptions changes is \$0 for amortization purposes.

Schedule of Past Service Cost Amortizations - Total (\$'s in 000's)

	Amortizat	ion Period	В			es	
Layer	Date Created	Years Remaining		Initial	O	utstanding	ginning-of- ar Payment
Initial Unfunded Liability	06/30/2007	12	\$	(223)	\$	(215)	\$ (22)
Change in Assumptions	06/30/2008	13		84		86	9
FY08 Gain	06/30/2008	13		(785)		(760)	(76)
Change in Assumptions	06/30/2009	14		(151)		(148)	(14)
FY09 Gain	06/30/2009	14		(875)		(873)	(81)
Change in Assumptions	06/30/2010	15		(7)		(8)	(1)
FY10 Gain	06/30/2010	15		(1,024)		(1,032)	(92)
FY11 Gain	06/30/2011	16		(654)		(664)	(57)
Change in Assumptions	06/30/2012	17		11,518		11,819	966
FY12 Gain	06/30/2012	17		(189)		(191)	(16)
FY13 Loss	06/30/2013	18		3,290		3,392	267
Change in Assumptions	06/30/2014	19		(9,786)		(10,082)	(766)
PRPA Modification	06/30/2014	19		(25)		(25)	(2)
FY14 Loss	06/30/2014	19		1,361		1,401	106
FY15 Gain	06/30/2015	20		(3,760)		(3,863)	(285)
EGWP Impact	06/30/2016	21		(6,400)		(6,547)	(468)
FY16 Loss	06/30/2016	21		749		768	55
Change in Assumptions	06/30/2017	22		7,645		7,768	540
FY17 Gain	06/30/2017	22		(1,702)		(1,728)	(120)
Change in Assumptions/Methods	06/30/2018	23		(9,505)		(9,574)	(648)
FY18 Loss	06/30/2018	23		2,234		2,250	152
FY19 Gain	06/30/2019	24		(5,242)		(5,265)	(347)
Change in Assumptions	06/30/2020	25		2,153		2,153	139
FY20 Gain	06/30/2020	25		(2,292)		(2,292)	(148)
Total					\$	(13,630)	\$ (909)

Section 1.3: Actuarial Gain/(Loss) for FY20 (\$'s in 000's)

	D	upational eath & sability	Retiree Medical	Total
1. Expected Actuarial Accrued Liability				
a. Actuarial Accrued Liability as of June 30, 2019	\$	240	\$ 32,981	\$ 33,221
b. Normal Cost		284	2,967	3,251
c. Interest on (a) and (b) at 7.38%		39	2,653	2,692
d. Employer Group Waiver Plan		0	1	1
e. Benefit Payments		(24)	(6)	(30)
f. Interest on (d) and (e) at 7.38%, adjusted for timing		(1)	0	(1)
g. Assumption/Method Changes		0	2,153	 2,153
h. Expected Actuarial Accrued Liability as of June 30, 2020 (a) + (b) + (c) + (d) + (e) + (f) + (g)	\$	538	\$ 40,749	\$ 41,287
2. Actual Actuarial Accrued Liability as of June 30, 2020		223	40,634	 40,857
3. Liability Gain/(Loss), (1)(h) - (2)	\$	315	\$ 115	\$ 430
4. Expected Actuarial Asset Value				
a. Actuarial Asset Value as of June 30, 2019	\$	4,359	\$ 42,307	\$ 46,666
b. Interest on (a) at 7.38%		322	3,122	3,444
c. Employer Contributions		329	4,461	4,790
d. Employer Group Waiver Plan		0	1	1
e. Interest on (c) and (d) at 7.38%, adjusted for timing		12	162	174
f. Benefit Payments		(24)	(6)	(30)
g. Administrative Expenses		0	(9)	(9)
h. Interest on (f) and (g) at 7.38%, adjusted for timing		(1)	 (1)	 (2)
i. Expected Actuarial Asset Value as of June 30, 2020(a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	\$	4,997	\$ 50,037	\$ 55,034
5. Actuarial Asset Value as of June 30, 2020		4,933	49,554	 54,487
6. Actuarial Asset Gain/(Loss), (5) - (4)(i)	\$	(64)	\$ (483)	\$ (547)
7. Total Actuarial Gain/(Loss), (3) + (6)	\$	251	\$ (368)	\$ (117)
8. Contribution Gain/(Loss)	\$	386	\$ 2,027	\$ 2,413
9. Administrative Expense Gain/(Loss)	\$	0	\$ (4)	\$ (4)
10. FY20 Gain/(Loss), (7) + (8) + (9)	\$	637	\$ 1,655	\$ 2,292

Section 1.4: History of Unfunded Liability and Funded Ratio (\$'s in 000's)

Valuation Date	Total Ac		Valua	ation Assets	Pero Act	ets as a cent of tuarial ed Liability	Ac	Unfunded Actuarial crued Liability (UAAL)
June 30, 2007	\$	374	\$	597	1	59.7%	\$	(223)
June 30, 2008		801		1,728	2	15.7%		(927)
June 30, 2009	1,	,460		3,424	2	34.5%		(1,964)
June 30, 2010	2	,448		5,472	2	23.5%		(3,024)
June 30, 2011	3	,858		7,566	1	96.1%		(3,708)
June 30, 2012	16	,874		9,285		55.0%		7,589
June 30, 2013	22	,138		11,146		50.3%		10,992
June 30, 2014	16	,296		13,611		83.5%		2,685
June 30, 2015	19	,797		20,847	1	05.3%		(1,050)
June 30, 2016	22	,007		28,733	1	30.6%		(6,726)
June 30, 2017	33	,707		34,586	1	02.6%		(879)
June 30, 2018	32	,459		40,621	1	25.1%		(8,162)
June 30, 2019	33	,221		46,666	1	40.5%		(13,445)
June 30, 2020	40	,857		54,487	1	33.4%		(13,630)

Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets (\$'s in 000's)

As of June 30, 2020	D	upational eath & sability	Retiree Medical	Total	Allocation Percent
Cash and Short-Term Investments					
- Cash and Cash Equivalents	\$	50	\$ 506	\$ 556	1.1%
- Subtotal	\$	50	\$ 506	\$ 556	1.1%
Fixed Income Investments					
- Domestic Fixed Income Pool	\$	1,037	\$ 10,385	\$ 11,422	21.6%
- International Fixed Income Pool		0	0	0	0.0%
- Tactical Fixed Income Pool		0	0	0	0.0%
- High Yield Pool		0	0	0	0.0%
- Treasury Inflation Protection Pool		0	0	0	0.0%
- Emerging Debt Pool		0	0	0	0.0%
- Subtotal	\$	1,037	\$ 10,385	\$ 11,422	21.6%
Equity Investments					
- Domestic Equity Pool	\$	1,307	\$ 13,085	\$ 14,392	27.3%
- International Equity Pool		746	7,466	8,212	15.5%
- Private Equity Pool		591	5,921	6,512	12.3%
- Emerging Markets Equity Pool		156	1,561	1,717	3.3%
- Alternative Equity Strategies		260	2,605	2,865	5.4%
- Subtotal	\$	3,060	\$ 30,638	\$ 33,698	63.8%
Other Investments					
- Real Estate Pool	\$	295	\$ 2,954	\$ 3,249	6.2%
- Other Investments Pool		353	3,528	3,881	7.3%
- Absolute Return Pool		0	0	0	0.0%
- Other Assets		0	 0	 0	0.0%
- Subtotal	\$	648	\$ 6,482	\$ 7,130	13.5%
Total Cash and Investments	\$	4,795	\$ 48,011	\$ 52,806	100.0%
Net Accrued Receivables		28	 402	430	
Net Assets	\$	4,823	\$ 48,413	\$ 53,236	

Section 2.2: Changes in Fair Value of Assets During FY20 (\$'s in 000's)

Fiscal Year 2020	D	upational eath & sability	Retiree Medical	Total		
1. Fair Value of Assets as of June 30, 2019	\$	4,328	\$ 42,067	\$	46,395	
2. Additions:						
a. Member Contributions	\$	0	\$ 0	\$	0	
b. Employer Contributions		329	4,461		4,790	
c. Interest and Dividend Income		68	674		742	
 d. Net Appreciation/(Depreciation) in Fair Value of Investments 		135	1,350		1,485	
e. Employer Group Waiver Plan		0	1		1	
f. Other		0	0		0	
g. Total Additions	\$	532	\$ 6,486	\$	7,018	
3. Deductions:						
a. Medical Benefits	\$	0	\$ 6	\$	6	
b. Death & Disability Benefits		24	0		24	
c. Investment Expenses		13	125		138	
d. Administrative Expenses		0	 9		9	
e. Total Deductions	\$	37	\$ 140	\$	177	
4. Fair Value of Assets as of June 30, 2020	\$	4,823	\$ 48,413	\$	53,236	
Approximate Fair Value Investment Return Rate during FY20 Net of Investment Expenses		4.2%	4.3%		4.3%	

Section 2.3: Development of Actuarial Value of Assets (\$'s in 000's)

The actuarial value of assets and the fair value were \$0 at June 30, 2006. Investment gains and losses are recognized 20% per year over 5 years. In no event may valuation assets be less than 80% or more than 120% of fair value as of the current valuation date.

		cupational Death & Disability	Retiree Medical	Total
1. Investment Gain/(Loss) for FY20				
a. Fair Value as of June 30, 2019	\$	4,328	\$ 42,067	\$ 46,395
b. Contributions		329	4,461	4,790
c. Employer Group Waiver Plan		0	1	1
d. Benefit Payments		24	6	30
e. Administrative Expenses		0	9	9
f. Actual Investment Return (net of investment expenses)		190	1,899	2,089
g. Expected Return Rate (net of investment expenses)		7.38%	7.38%	7.38%
h. Expected Return		330	3,266	3,596
i. Investment Gain/(Loss) for the Year (f) - (h)		(140)	(1,367)	(1,507)
2. Actuarial Value as of June 30, 2020				
a. Fair Value as of June 30, 2020	\$	4,823	\$ 48,413	\$ 53,236
b. Deferred Investment Gain/(Loss)		(110)	(1,141)	(1,251)
c. Preliminary Actuarial Value as of June 30, 2020, (a) - (b)		4,933	49,554	54,487
d. Upper Limit: 120% of Fair Value as of June 30, 2020		5,787	58,095	63,882
e. Lower Limit: 80% of Fair Value as of June 30, 2020		3,859	38,731	42,590
f. Actuarial Value at June 30, 2020, (c) limited by (d) and (e))	4,933	49,554	54,487
3. Ratio of Actuarial Value of Assets to Fair Value of Assets		102.3%	102.4%	102.3%
Approximate Actuarial Value Investment Return Rate during FY20 Net of Investment Expenses		6.0%	6.3%	6.3%

The tables below show the development of the gains/(losses) to be recognized in the current year (\$'s in 000's):

Occupational Death & Disability											
Fiscal Year Ending		et Gain / .oss)	Gain / (Loss) Recognized in Prior Years		Gain / (Loss) Recognized This Year		d Deferred				
June 30, 2016	\$	(269)	\$	(216)	\$	(53)	\$	0			
June 30, 2017		143		87		28		28			
June 30, 2018		8		4		2		2			
June 30, 2019		(48)		(10)		(10)		(28)			
June 30, 2020		(140)		0		(28)		(112)			
Total	\$	(306)	\$	(135)	\$	(61)	\$	(110)			

Retiree Medical											
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years							
June 30, 2016	\$ (1,674)	\$ (1,340)	\$ (334)	\$ 0							
June 30, 2017	1,184	711	237	236							
June 30, 2018	(19)	(8)	(4)	(7)							
June 30, 2019	(460)	(92)	(92)	(276)							
June 30, 2020	(1,367)	0	(273)	(1,094)							
Total	\$ (2,336)	\$ (729)	\$ (466)	\$ (1,141)							

Total								
Fiscal Year Ending	Asset Ga (Loss		Rec	/ (Loss) ognized ior Years	Reco	/ (Loss) gnized s Year	Def	n / (Loss) erred to ire Years
June 30, 2016	\$ (1,9	943)	\$	(1,556)	\$	(387)	\$	0
June 30, 2017	1,3	327		798		265		264
June 30, 2018		(11)		(4)		(2)		(5)
June 30, 2019	(!	508)		(102)		(102)		(304)
June 30, 2020	(1,	507 <u>)</u>		0		(301)		(1,206)
Total	\$ (2,0	642)	\$	(864)	\$	(527)	\$	(1,251)

Section 2.4: Historical Asset Rates of Return

	Actuarial Value		Fair	· Value
Year Ending	Annual	Cumulative*	Annual	Cumulative*
June 30, 2008	6.4%	6.4%	(0.3%)	(0.3%)
June 30, 2009	3.2%	4.8%	(12.0%)	(6.3%)
June 30, 2010	4.2%	4.6%	6.4%	(2.3%)
June 30, 2011	7.4%	5.3%	18.9%	2.6%
June 30, 2012	6.9%	5.6%	1.6%	2.4%
June 30, 2013	7.7%	6.0%	11.9%	3.9%
June 30, 2014	10.9%	6.6%	18.0%	5.8%
June 30, 2015	9.5%	7.0%	3.1%	5.5%
June 30, 2016	6.5%	6.9%	(0.1%)	4.9%
June 30, 2017	7.6%	7.0%	12.6%	5.6%
June 30, 2018	7.8%	7.1%	8.0%	5.8%
June 30, 2019	6.4%	7.0%	6.2%	5.9%
June 30, 2020	6.3%	7.0%	4.3%	5.7%

^{*} Cumulative since fiscal year ending June 30, 2008

Section 3: Member Data

Section 3.1: Summary of Members Included

As of June 30	2016	2017	2018	2019	2020
Active Members					
1. Number	4,383	4,694	4,915	4,998	5,332 ¹
2. Average Age	39.57	40.21	40.64	41.06	41.63
3. Average Credited Service	4.50	4.88	5.30	5.67	6.03
4. Average Entry Age	35.07	35.33	35.34	35.39	35.60
5. Average Annual Earnings	\$ 65,219	\$ 66,542	\$ 68,119	\$ 69,619	\$ 71,118
Disabilitants and Beneficiaries (Occu	pational Death	a & Disability)			
1. Number	0	0	0	1	1
2. Average Age	N/A	N/A	N/A	53.45	54.45
Average Monthly Death & Disability Benefit	N/A	N/A	N/A	\$ 2,024	\$ 2,024
Retirees, Surviving Spouses, and Dep	endent Spous	ses (Retiree Med	dical)		
1. Number	0	4	9	12	17
2. Average Age	N/A	69.72	68.59	68.54	68.79
Total Number of Members	4,383	4,698	4,924	5,011	5,350

Average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

State of Alaska TRS Defined Contribution Retirement Plan

¹ Includes 1,376 male active members and 3,956 female active members.

Section 3.2: Age and Service Distribution of Active Members

Annual Earnings by Age

Total **Average** Annual Annual Age Number **Earnings Earnings** 0 - 19 0 \$ 0 \$ 0 20 - 24 52,650 100 5,264,970 25 - 29 613 36,111,642 58,910 30 - 34 61,660,845 66,018 934 35 - 39 1,068 76,404,382 71,540 40 - 44 815 59,917,766 73,519 45 - 49 575 43,754,516 76,095 50 - 54 477 36,408,923 76,329 55 - 59 403 31,603,348 78,420 60 - 64 239 19,252,737 80,555 82,233 65 - 69 84 6,907,610 70 - 74 20 76,565 1,531,296 75+ 4 382,756 95,689

Total 5,332 \$ 379,200,791 \$ 71,118

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	134	\$ 7,253,235	\$ 54,129
1	646	39,337,478	60,894
2	574	37,066,265	64,575
3	494	32,421,369	65,630
4	478	32,777,831	68,573
0 - 4	2,326	\$ 148,856,178	\$ 63,997
5 - 9	1,841	134,954,143	73,305
10 - 14	1,162	95,121,574	81,860
15 - 19	2	174,019	87,010
20 - 24	1	94,877	94,877
25 - 29	0	0	0
30 - 34	0	0	0
35 - 39	0	0	0
40+	0	0	0
Total	5,332	\$ 379,200,791	\$ 71,118

Years of Credited Service by Age

	Years of Service									
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	100	0	0	0	0	0	0	0	0	100
25 - 29	505	108	0	0	0	0	0	0	0	613
30 - 34	441	440	53	0	0	0	0	0	0	934
35 - 39	325	380	363	0	0	0	0	0	0	1,068
40 - 44	297	289	228	1	0	0	0	0	0	815
45 - 49	213	199	163	0	0	0	0	0	0	575
50 - 54	169	172	135	0	1	0	0	0	0	477
55 - 59	146	136	121	0	0	0	0	0	0	403
60 - 64	83	84	71	1	0	0	0	0	0	239
65 - 69	32	27	25	0	0	0	0	0	0	84
70 - 74	14	4	2	0	0	0	0	0	0	20
75+	1	2	1	0	0	0	0	0	0	4
Total	2,326	1,841	1,162	2	1	0	0	0	0	5,332

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 3.3: Member Data Reconciliation

	Actives	Retirees and Surviving Spouses	Dependent Spouses	OD&D Disabilitants	OD&D Beneficiaries	Total
As of June 30, 2019 ¹	4,998	10	2	1	0	5,011
New Entrants	664	0	0	0	0	664
Rehires	306	0	0	0	0	306
Vested Terminations	(230)	0	0	0	0	(230)
Non-Vested Terminations	(358)	0	0	0	0	(358)
Refund of Contributions	(42)	0	0	0	0	(42)
Disability Retirements	0	0	0	0	0	0
Age Retirements	(4)	4	1	0	0	1
Deaths With Beneficiary	0	0	0	0	0	0
Deaths Without Beneficiary	(2)	0	0	0	0	(2)
Data Corrections	0	0	0	0	0	0
Net Change	334	4	1	0	0	339
As of June 30, 2020 ²	5,332	14	3	1	0	5,350

¹ 117 participants are expected to receive retiree medical benefits in a different plan and are included for OD&D benefits only.

² 125 participants are expected to receive retiree medical benefits in a different plan and are included for OD&D benefits only.

Section 3.4: Schedule of Active Member Data

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase in Average Earnings	Number of Participating Employers
June 30, 2020	5,332	\$ 379,201	\$ 71,118	2.2%	57
June 30, 2019	4,998	347,957	69,619	2.2%	57
June 30, 2018	4,915	334,803	68,119	2.4%	57
June 30, 2017	4,694	312,347	66,542	2.0%	57
June 30, 2016	4,383	285,854	65,219	2.5%	58
June 30, 2015	4,095	260,584	63,635	2.7%	58
June 30, 2014	3,547	219,701	61,940	2.4%	58
June 30, 2013	3,272	197,944	60,496	3.5%	58
June 30, 2012	3,057	178,761	58,476	4.7%	58
June 30, 2011	2,708	151,269	55,860	5.6%	58

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

Section 3.5: Active Member Payroll Reconciliation

Payroll Field	Payroll Data (000's)
a) DRB actual reported salaries FY20 in employer list	\$ 411,891
b) DRB actual reported salaries FY20 in valuation data	371,022
c) Annualized valuation data	379,201
d) Valuation payroll as of June 30, 2020	396,606
e) Rate payroll for FY21	391,854

- a) Actual reported salaries from DRB employer listing showing all payroll paid during FY20, including those who were not active as of June 30, 2020
- b) Payroll from valuation data for people who are in active status as of June 30, 2020
- c) Payroll from (b) annualized for both new entrants and part-timers
- d) Payroll from (c) with one year of salary scale applied to estimate salaries payable for the upcoming year
- e) Payroll from (d) with the part-timer annualization removed

Section 4: Basis of the Actuarial Valuation

Section 4.1: Summary of Plan Provisions

Effective Date

July 1, 2006, with amendments through June 30, 2020.

Administration of Plan

The Commissioner of Administration or the Commissioner's designee is the administrator of the Plan. The Attorney General of the state is the legal counsel for the Plan and shall advise the administrator and represent the Plan in legal proceedings.

The Alaska Retirement Management Board prescribes policies, adopts regulations, invests the funds, and performs other activities necessary to carry out the provisions of the Plan.

Employers Included

Currently there are 57 employers participating in TRS DCR, including the State of Alaska, 53 school districts, and three other eligible organizations.

Membership

An employee of a participating employer who first enters service on or after July 1, 2006, or a member of the defined benefit plan who works for an employer who began participation on or after July 1, 2006, and meets the following criteria is a member in the Plan:

- Permanent full-time or part-time elementary or secondary teachers, school nurses, or a person in a
 position requiring a teaching certificate as a condition of hire in a public school of the State of Alaska,
 the Department of Education and Early Development, or in the Department of Labor and Workforce
 Development.
- Full-time or part-time teachers at the University of Alaska or persons occupying full-time administrative positions requiring academic standing who are not in the University's Optional Retirement Plan.

Members can convert to TRS DCR if they are an eligible non-vested member of the TRS defined benefit plan whose employer consents to transfers to the defined contribution plan and they elect to transfer his or her account balance to TRS DCR.

Member Contributions

Other than the member-paid premiums discussed later in this section, there are no member contributions for the occupational death & disability and retiree medical benefits.

Retiree Medical Benefits

- Member must retire directly from the plan to be eligible for retiree medical coverage. Normal
 retirement eligibility is the earlier of a) 30 years of service or b) Medicare eligible and 10 years of
 service.
- No subsidized retiree medical benefits are provided until normal retirement eligibility. The member's
 and any covered dependent's premium is 100% until the member is Medicare eligible. Upon the
 member's Medicare-eligibility, the required contribution will follow the service-based schedule shown
 below.
- Coverage cannot be denied except for failure to pay premium.
- Members who are receiving disability benefits or survivors who are receiving monthly survivor benefits are not eligible until the member meets, or would have met if he/she had lived, the normal retirement eligibility requirements.
- The following is a summary of the medical benefit design adopted in July 2016. The plan description below is used for valuation purposes and indicates participant cost-sharing. Please refer to the benefit handbook for more details.

Plan Design Feature	In-Network ¹	Out-of-Network ^{1 2}		
Deductible (single / family)	\$300 / \$600			
Medical services (participant share)	20%	40%		
Emergency Room Copay (non-emergent use)	\$100	\$100		
Medical Out-of-Pocket Maximum (single / family, including deductible)	\$1,500 / \$3,000	\$3,000 / \$6,000		
Medicare Coordination	Exclusion	Exclusion		
Pharmacy	No Deductible	No Deductible		
Retail Generic (per 30-day fill)	20% \$10 min / \$50 max			
Retail Non-Formulary Brand (per 30-day fill)	25% \$25 min / \$75 max	40%		
Retail Formulary Brand (per 30-day fill)	35% \$80 min / \$150 max			
Mail-Order Generic	\$20 copay			
Mail-Order Non-Formulary Brand	\$50 copay	40%		
Mail-Order Formulary Brand	\$100 copay			
Pharmacy Out-of-Pocket Max (single / family)	\$1,000	/ \$2,000		
Medicare Pharmacy Arrangement	Retiree Drug Subsidy / Employer Group Waiver Plan effective 1/1/2019			
Wellness / Preventative	100% covered, not subject to deductible	20%, after deductible		

-

Section 1.1 of the AlaskaCare Defined Contribution Retiree Benefit Plan states that this health plan shall be updated from time to time to reflect changes in benefits, including annual adjustments to the premium, deductible, coinsurance, medical out-of-pocket limit, and prescription drug out-of-pocket limit.

² OON applies only to non-Medicare eligible participants.

- Buck used manual rate models to determine relative plan values for the defined benefit (DB) retiree medical plan and the DCR retiree medical plan outlined above. We applied the ratio of the DCR retiree medical plan value to the DB retiree medical plan value to the per capita costs determined for each of pre/post-Medicare medical and pharmacy benefits to estimate corresponding values for the DCR retiree medical plan design. These factors are noted in Section 4.3. We further adjusted the Medicare medical manual rate to reflect the Medicare coordination method adopted. The estimated 2021 reimbursements under EGWP were provided by Segal Consulting (who worked with the EGWP administrator, Optum, to develop those estimates). We reflect estimated discounts and pharmacy rebates in the defined benefit medical cost so no further adjustment was needed for the DCR retiree medical plan. The medical network differential is reflected in the relative plan value adjustments.
- The retiree medical plan's coverage is supplemental to Medicare. Medicare coordination is described in the 2020 DCR Plan Handbook, referred to in the industry as exclusion coordination: Medicare payment is deducted from the Medicare allowable expense and plan parameters are applied to the remaining amount. Starting in 2019, the prescription drug coverage is through a Medicare Part D EGWP arrangement.
- The premium for Medicare-eligible retirees will be based on the member's years of service. The percentage of premium paid by the member is as follows:

Years of Service	Percent of Premium Paid by Member
< 15	30%
15 – 19	25%
20 – 24	20%
25 – 29	15%
30+	10%

- The premium for dependents who are not eligible for Medicare aligns with the member's subsidy. While a member is not Medicare-eligible, premiums are 100% of the estimated cost.
- Members have a separate defined contribution Health Reimbursement Arrangement account, which is not reflected in this valuation, that can be used to pay for premiums or other medical expenses.
- For valuation purposes, retiree premiums were assumed to equal the percentages outlined in the
 table above times the age-related plan costs. Future premiums calculated and charged to DCR
 participants will need to be determined reflecting any appropriate adjustments to the defined benefit
 (DB) plan data because current DB premiums were determined using information based upon
 enrollment with members who have double coverage.
- Coverage will continue for surviving spouses of covered retired members.

Occupational Disability Benefits

- Benefit is 40% of salary at date of disability.
- Disability Benefit Adjustment: The disability benefit is increased by 75% of the cost of living increase in the preceding calendar year or 9%, whichever is less.
- Member earns service while on occupational disability.
- Benefits cease when the member becomes eligible for normal retirement at Medicare-eligible age and 10 years of service, or at any age with 30 years of service.
- No subsidized retiree medical benefits are provided until normal retirement eligibility. The member's premium is 100% of the estimated cost until they are Medicare eligible. Medicare-eligible premiums follow the service-based schedule above.

Occupational Death Benefits

- Benefit is 40% of salary.
- Survivor's Pension Adjustment: A survivor's pension is increased by 50% of the cost of living increase in the preceding calendar year or 6%, whichever is less, if the recipient is at least age 60 on July 1, or under age 60 if the recipient has been receiving TRS benefits for at least 8 years as of July 1.
- · Benefits cease when the member would have become eligible for normal retirement.
- The period during which the survivor is receiving benefits is counted as service credit toward retiree
 medical benefits.
- No subsidized retiree medical benefits are provided until the member would have been eligible for normal retirement. The surviving spouse's premium is 100% of the estimated cost until the member would have been Medicare eligible. Medicare-eligible premiums follow the service-based schedule above.

Changes Since the Prior Valuation

There have been no changes in TRS DCR benefit provisions valued since the prior valuation.

Section 4.2: Description of Actuarial Methods and Valuation Procedures

The funding method used in this valuation was adopted by the Board in October 2006, and was modified as part of the experience study for the period July 1, 2013 to June 30, 2017. The asset smoothing method used to determine valuation assets was implemented effective June 30, 2006.

Benefits valued are those delineated in Alaska State statutes as of the valuation date. Changes in State statutes effective after the valuation date are not taken into consideration in setting the assumptions and methods.

Actuarial Cost Method

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method, level percent of pay. Each year's difference between actual and expected unfunded actuarial accrued liability is amortized over 25 years as a level percentage of expected payroll.

Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year for death and disability benefits and retiree medical benefits, from the assumed entry age to the last age with a future benefit were applied to the projected benefits to determine the normal cost (the portion of the total cost of the plan allocated to the current year under the method). The normal cost is determined by summing intermediate results for active members and determining an average normal cost rate which is then related to the total DCR Plan payroll of active members. The actuarial accrued liability for active members (the portion of the total cost of the plan allocated to prior years under the method) was determined as the excess of the actuarial present value of projected benefits over the actuarial present value of future normal costs.

The actuarial accrued liability for beneficiaries and disabled members currently receiving benefits (if any) was determined as the actuarial present value of the benefits expected to be paid. No future normal costs are payable for these members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of plan assets measured on the valuation date.

Under this method, experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

Valuation of Assets

Effective June 30, 2006, the asset valuation method recognizes 20% of the investment gain or loss in each of the current and preceding four years. This method was phased in over five years. Fair Value of Assets was \$0 as of June 30, 2006. All assets are valued at fair value. Assets are accounted for on an accrued basis and are taken directly from financial statements audited by KPMG LLP. Valuation assets are constrained to a range of 80% to 120% of the fair value of assets.

Changes in Methods Since the Prior Valuation

There were no changes in the asset or valuation methods since the prior valuation.

Valuation of Retiree Medical and Prescription Drug Benefits

The methodology used for the valuation of the retiree medical benefits is described in Section 5.2 of the State of Alaska Teachers' Retirement System Defined Benefit Plan Actuarial Valuation Report as of June 30, 2020.

Due to the lack of experience for the DCR retiree medical plan only, base claims costs are based on those described in the actuarial valuation as of June 30, 2020 for the Defined Benefit (DB) retiree medical plan covering TRS and PERS. The DB rates were used with some adjustments. The claims costs were adjusted to reflect the differences between the DCR medical plan and the DB medical plan. These differences include network steerage, different coverage levels, different Medicare coordination for medical benefits, and an indexing of the retiree out-of-pocket dollar amounts. To account for higher initial copays, deductibles and out-of-pocket limits, projected FY21 claims costs were reduced 3.1% for medical claims, and 8.9% for prescription drugs. In addition, to account for the difference in Medicare coordination, projected FY21 medical claims costs for Medicare eligible retirees were further reduced 29.5%.

FY19 and FY20 experience were compared to assess the impact of COVID-19 and whether an adjustment to FY20 claims was indicated for use in the June 30, 2020 valuation. A material decrease in medical claims during March 2020 to June 2020 was experienced due to COVID-19. Therefore, an adjustment was made for those months to adjust for the decrease that is not expected to continue in future years. There was an observed spike in prescription drug claims in March 2020; however, the FY20 prescription drug experience appears reasonable to use without adjustment for COVID-19. To adjust for the decrease in medical claims due to COVID-19 during the last 4 months of FY20, the per capita cost during the first 8 months was used as the basis for estimating claims that would have occurred in the absence of COVID-19.

No implicit subsidies are assumed. Employees projected to retire with 30 years of service prior to Medicare are valued with commencement deferred to Medicare eligibility, because those members will be required to pay the full plan premium prior to Medicare. Explicit subsidies for disabled and normal retirement are determined using the plan-defined percentages of age-related total projected plan costs, again with no implicit subsidy assumed.

The State transitioned to an Employer Group Waiver Program (EGWP) for DCR participants effective January 1, 2019. The estimated 2021 reimbursements under EGWP were provided by Segal Consulting (who worked with the EGWP administrator, Optum, to develop those estimates).

Healthcare Reform

Healthcare Reform legislation passed on March 23, 2010 included several provisions with potential implications for the State of Alaska Retiree Health Plan liability. Buck evaluated the impact due to these provisions.

Because the State plan is retiree-only, not all provisions are required. Unlimited lifetime benefits and dependent coverage to age 26 are two of these provisions. The adopted DCR plan does not place lifetime limits on benefits, but does restrict dependent child coverage.

The Further Consolidated Appropriations Act, 2020 passed in December 2019 repealed several healthcare-related taxes, including the Cadillac Tax.

The Tax Cuts and Jobs Act passed in December 2017 included the elimination of the individual mandate penalty and changed the inflation measure for purposes of determining the limits for the High Cost Excise Tax to use chained CPI. It is our understanding the law does not directly impact other provisions of the ACA. While the nullification of the ACA's individual mandate penalty does not directly impact employer group health plans, it could contribute to the destabilization of the individual market and increase the number of uninsured. Such destabilization could translate to increased costs for employers. We have considered this when setting our healthcare cost trend assumptions and will continue to monitor this issue.

We have not identified any other specific provisions of healthcare reform or its potential repeal that would be expected to have a significant impact on the measured obligation. We will continue to monitor legislative activity.

Section 4.3: Summary of Actuarial Assumptions

The demographic and economic assumptions used in the June 30, 2020 valuation are described below. Unless noted otherwise, these assumptions were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017.

Investment Return

7.38% per year, net of investment expenses.

Salary Scale

Salary scale rates based upon the 2013-2017 actual experience (see Table 1).

Inflation – 2.50% per year.

Productivity – 0.25% per year.

Payroll Growth

2.75% per year (inflation + productivity).

Total Inflation

Total inflation as measured by the Consumer Price Index for urban and clerical workers for Anchorage is assumed to increase 2.50% annually.

Mortality (Pre-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

RP-2014 white-collar employee table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Deaths are assumed to result from occupational causes 15% of the time.

Mortality (Post-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

93% of male and 90% of female rates of RP-2014 white-collar healthy annuitant table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Turnover

Select and ultimate rates based upon the 2013-2017 actual experience (see Table 2).

Disability

Incidence rates based upon the 2013-2017 actual experience (see Table 3).

Disabilities are assumed to be occupational 15% of the time.

Post-disability mortality in accordance with the RP-2014 disabled table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Retirement

Retirement rates based upon the 2013-2017 actual experience (see Table 4).

Spouse Age Difference

Males are assumed to be three years older than their wives. Females are assumed to be two years younger than husbands.

Percent Married for Occupational Death & Disability

85% of male members and 75% of female members are assumed to be married at termination from active service.

Dependent Spouse Medical Coverage Election

Applies to members who do not have double medical coverage. 65% of male members and 60% of female members are assumed to be married and cover a dependent spouse.

Part-Time Status

Part-time employees are assumed to earn 0.75 years of service per year.

Per Capita Claims Cost

Sample claims cost rates (before base claims cost adjustments described below) adjusted to age 65 for FY21 medical and prescription drugs are shown below:

	į	Medical	Presc	ription Drugs
Pre-Medicare	\$	15,360	\$	3,393
Medicare Parts A & B	\$	1,618	\$	3,340
Medicare Part D – EGWP		N/A	\$	1,003

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2021 fiscal year (July 1, 2020 – June 30, 2021).

The EGWP subsidy is assumed to increase in future years by the trend rates shown on the following pages. No future legislative changes or other events are anticipated to impact the EGWP subsidy. If any legislative or other changes occur in the future that impact the EGWP subsidy (which could either increase or decrease the plan's Actuarial Accrued Liability), those changes will be evaluated and quantified when they occur.

Third Party Administrator Fees

\$449 per person per year; assumed to increase at 4.5% per year.

Base Claims Cost Adjustments

Due to higher initial copays, deductibles, out-of-pocket limits and member cost sharing compared to the DB medical plan, the following cost adjustments are applied to the per capita claims cost rates above:

- 0.969 for the pre-Medicare plan.
- 0.674 for both the Medicare medical plan and Medicare coordination method (3.1% reduction for the medical plan and 29.5% reduction for the coordination method).
- 0.911 for the prescription drug plan.

Administrative Expenses

Beginning with the June 30, 2018 valuation, the Normal Cost is increased for administrative expenses expected to be paid from plan assets during the year. The amounts included in the June 30, 2020 Normal Cost, which are based on the average of actual administrative expenses during the last two fiscal years, are \$0 for occupational death & disability and \$8,000 for retiree medical.

Healthcare Cost Trend

The table below shows the rate used to project the cost from the shown fiscal year to the next fiscal year. For example, 6.5% is applied to the FY21 pre-Medicare medical claims costs to get the FY22 medical claims costs.

	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY21	6.5%	5.4%	7.5%
FY22	6.3%	5.4%	7.1%
FY23	6.1%	5.4%	6.8%
FY24	5.9%	5.4%	6.4%
FY25	5.8%	5.4%	6.1%
FY26	5.6%	5.4%	5.7%
FY27-FY40	5.4%	5.4%	5.4%
FY41	5.3%	5.3%	5.3%
FY42	5.2%	5.2%	5.2%
FY43	5.1%	5.1%	5.1%
FY44	5.1%	5.1%	5.1%
FY45	5.0%	5.0%	5.0%
FY46	4.9%	4.9%	4.9%
FY47	4.8%	4.8%	4.8%
FY48	4.7%	4.7%	4.7%
FY49	4.6%	4.6%	4.6%
FY50+	4.5%	4.5%	4.5%

For the June 30, 2014 valuation and later, the updated Society of Actuaries' Healthcare Cost Trend Model is used to project medical and prescription drug costs. This model estimates trend amounts that are projected out for 80 years. The model has been populated with assumptions that are specific to the State of Alaska.

Aging Factors

		Prescription
Age	Medical	Drugs
0 – 44	2.0%	4.5%
45 – 54	2.5%	3.5%
55 – 64	2.5%	1.5%
65 – 74	3.0%	2.0%
75 – 84	2.0%	-0.5%
85 – 94	0.3%	-2.5%
95+	0.0%	0.0%

Retiree Medical Participation

Decrement Due to Disability		Decrei	Decrement Due to Retirement		
Age	Percent Participation	Age	Percent Part	icipation*	
< 56	75.0%	55	50.0	%	
56	77.5%	56	55.0	%	
57	80.0%	57	60.0	%	
58	82.5%	58	65.0	%	
59	85.0%	59	70.0	%	
60	87.5%	60	75.0	%	
61	90.0%	61	80.0	%	
62	92.5%	62	85.0	%	
63	95.0%	63	90.0	%	
64	97.5%	64	95.0	%	
65+	100.0%	65+	Years of S	Service	
			< 15	75.0%	
			15 – 19	80.0%	
			20 – 24	85.0%	
			25 – 29	90.0%	
			30+	95.0%	

^{*} Participation assumption is a combination of (i) the service-based rates for retirement from employment at age 65+ and (ii) the age-based rates for retirement from employment before age 65. These rates reflect the expected plan election rate that varies by reason for decrement, duration that a member may pay full cost prior to Medicare eligibility, and availability of alternative and/or lower cost options, particularly in the Medicare market. This assumption is based on observed trends in participation from a range of other plans.

Imputed Data

Data changes from the prior year which are deemed to have immaterial impact on liabilities and contribution rates are assumed to be correct in the current year's client data. Non-vested terminations with appropriate refund dates are assumed to have received a full refund of contributions. Active members with missing salary and service are assumed to be terminated with status based on their vesting percentage.

Changes in Assumptions Since the Prior Valuation

The amount included in the Normal Cost for administrative expenses was changed from \$4,700 to \$8,000 for retiree medical, while occupational death & disability remained at \$0 (based on the most recent two years of actual administrative expenses paid from plan assets). The per capita claims cost assumption is updated annually. The medical and prescription drug relative value factors were updated and the 0.2% annual trend rate adjustment factor between the DB and DCR plans was removed.

Table 1: Salary Scale

Years of Service	Percent Increase
0	6.75%
1	6.25%
2	5.75%
3	5.25%
4	4.75%
5	4.25%
6	3.75%
7	3.65%
8	3.55%
9	3.45%
10	3.35%
11	3.25%
12	3.15%
13	3.05%
14	2.95%
15	2.85%
16+	2.75%

Table 2: Turnover Rates

Select Rates during the First 6 Years of Employment

Years of Service	Male	Female
0	20.70%	21.80%
1	19.55%	18.70%
2	16.10%	15.40%
3	13.80%	13.20%
4	11.50%	11.00%
5	7.32%	8.05%

Ultimate Rates after the First 6 Years of Employment

Age	Male	Female	Age	Male	Female
< 26	9.41%	8.31%	45	9.05%	8.09%
26	9.41%	8.32%	46	8.99%	8.07%
27	9.40%	8.33%	47	8.94%	8.04%
28	9.39%	8.32%	48	8.86%	8.00%
29	9.39%	8.32%	49	8.78%	7.95%
30	9.38%	8.31%	50	8.70%	7.91%
31	9.37%	8.31%	51	8.62%	7.86%
32	9.36%	8.30%	52	8.54%	7.82%
33	9.35%	8.29%	53	8.37%	7.73%
34	9.35%	8.28%	54	8.20%	7.64%
35	9.34%	8.27%	55	8.03%	7.55%
36	9.34%	8.26%	56	7.86%	7.46%
37	9.33%	8.25%	57	7.69%	7.36%
38	9.31%	8.24%	58	7.76%	7.50%
39	9.29%	8.22%	59	7.82%	7.64%
40	9.26%	8.21%	60	7.89%	7.78%
41	9.24%	8.19%	61	7.95%	7.92%
42	9.22%	8.17%	62	8.02%	8.05%
43	9.16%	8.15%	63	8.59%	8.29%
44	9.11%	8.12%	64	9.17%	8.52%
			65+	9.75%	8.75%

Table 3: Disability Rates

Age	Male	Female
< 31	0.0337%	0.0612%
31	0.0337%	0.0613%
32	0.0337%	0.0613%
33	0.0342%	0.0622%
34	0.0347%	0.0631%
35	0.0353%	0.0641%
36	0.0357%	0.0650%
37	0.0362%	0.0659%
38	0.0371%	0.0674%
39	0.0379%	0.0689%
40	0.0387%	0.0703%
41	0.0395%	0.0718%
42	0.0403%	0.0733%
43	0.0423%	0.0770%
44	0.0443%	0.0806%
45	0.0464%	0.0843%
46	0.0483%	0.0879%
47	0.0504%	0.0916%
48	0.0536%	0.0975%
49	0.0569%	0.1034%
50	0.0601%	0.1093%
51	0.0634%	0.1152%
52	0.0666%	0.1211%
53	0.0746%	0.1356%
54	0.0826%	0.1501%

Table 4: Retirement Rates

Age	Rate
< 55	2.0%
55	3.0%
56	3.0%
57	3.0%
58	3.0%
59	3.0%
60	5.0%
61	5.0%
62	10.0%
63	5.0%
64	5.0%
65	25.0%
66	25.0%
67	25.0%
68	20.0%
69	20.0%
70+	100.0%

Glossary of Terms

Actuarial Accrued Liability

Total accumulated cost to fund pension or postemployment benefits arising from service in all prior years.

Actuarial Cost Method

Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension or postemployment plan for a group of plan members to the years of service that give rise to that cost.

Actuarial Present Value of Projected Benefits

Amount which, together with future interest, is expected to be sufficient to pay all future benefits.

Actuarial Valuation

Study of probable amounts of future pension or postemployment benefits and the necessary amount of contributions to fund those benefits.

Actuary

Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.

GASB 74 and 75

Governmental Accounting Standards Board Statement Number 74 amends Number 43 effective for the fiscal year beginning after June 15, 2016 and defines new financial reporting requirements for public postemployment benefit plans. Governmental Accounting Standards Board Statement Number 75 amends Number 45 effective for fiscal years beginning after June 15, 2017 and defines new accounting and financial reporting requirements for employers sponsoring public postemployment benefit plans.

Normal Cost

That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.

Rate Payroll

Members' earnings used to determine contribution rates.

Unfunded Actuarial Accrued Liability (UAAL)

The portion of the actuarial accrued liability not offset by plan assets.

Valuation Payroll

Members' earnings used to determine Normal Cost and Actuarial Accrued Liability.

Vested Benefits

Benefits which are unconditionally guaranteed regardless of employment.



State of Alaska

Judicial Retirement System

Actuarial Valuation Report As of June 30, 2020

May 2021



May 20, 2021

State of Alaska
The Alaska Retirement Management Board
The Department of Revenue, Treasury Division
The Department of Administration, Division of Retirement and Benefits
P.O. Box 110203
Juneau, AK 99811-0203

Certification of Actuarial Valuation

Dear Members of The Alaska Retirement Management Board, The Department of Revenue and The Department of Administration:

This report summarizes the actuarial valuation results of the State of Alaska Judicial Retirement System (JRS) as of June 30, 2020 performed by Buck Global, LLC (Buck). This report is an update to the draft report dated February 23, 2021, reflecting a change in the salary and pensioner benefit increase assumptions.

The actuarial valuation is based on financial information provided in the financial statements audited by KPMG LLP, member data provided by the Division of Retirement and Benefits, and medical enrollment data provided by the healthcare claims administrator (Aetna), as summarized in this report. The benefits considered are those delineated in Alaska statutes effective June 30, 2020. The actuary did not verify the data submitted, but did perform tests for consistency and reasonableness.

All costs, liabilities and other factors under JRS were determined in accordance with generally accepted actuarial principles and procedures. An actuarial cost method is used to measure the actuarial liabilities which we believe is reasonable. Buck is solely responsible for the actuarial data and actuarial results presented in this report. This report fully and fairly discloses the actuarial position of JRS as of June 30, 2020.

JRS is funded by Employer, State, and Member Contributions in accordance with the funding policy adopted by the Alaska Retirement Management Board (Board) and as required by Alaska state statutes. The funding objective for JRS is to pay required contributions that remain level as a percent of total JRS compensation. The Board has also established a funding policy objective that the required contributions be sufficient to pay the Normal Costs of active plan members, plan expenses, and amortize the annual changes in Unfunded Actuarial Accrued Liability as a level percentage of payroll over closed 25-year periods. The compensation used to determine required contributions is the total compensation of all active members in JRS. This objective is currently being met and is projected to continue to be met. Absent future gains/losses, actuarially determined contributions are expected to remain level as a percent of pay and the overall funded status (on a combined pension/healthcare basis) is expected to increase to 100% after 25 years.

The Board and staff of the State of Alaska may use this report for the review of the operations of JRS. Use of this report, for any other purpose or by anyone other than the Board or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, you should ask Buck to

review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without the review by Buck.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. In particular, retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the plan and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience under the plan. The actuary performs an analysis of plan experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience. The last full experience analysis was performed for the period July 1, 2013 to June 30, 2017. Based on that experience study, the Board adopted new assumptions effective beginning with the June 30, 2018 valuation to better reflect expected future experience. Based on our annual analysis of recent claims experience, changes were made to the per capita claim cost rates effective June 30, 2020 to better reflect expected future healthcare experience. At the request of State of Alaska staff, the salary and pensioner benefit increase assumptions were modified to be 0% per year for FY21 through FY24, and 3.62% per year thereafter to better reflect expected short-term experience. A summary of the actuarial assumptions and methods used in this actuarial valuation is shown in Sections 4.2 and 4.3. We certify that the assumptions and methods described in Sections 4.2 and 4.3 of this report meet the requirements of all applicable Actuarial Standards of Practice.

Governmental Accounting Standards Board (GASB) Statement No. 67 (GASB 67) was effective for JRS beginning with fiscal year ending June 30, 2014, and Statement No. 74 (GASB 74) was effective for JRS beginning with fiscal year ending June 30, 2017. Separate GASB 67 and GASB 74 reports as of June 30, 2020 have been prepared. We have also prepared the member data tables shown in Section 3 of this report for the Statistical Section of the CAFR, as well as the summary of actuarial assumptions and analysis of financial experience for the Actuarial Section of the CAFR. Please see our separate GASB 67 and GASB 74 reports for other information needed for the CAFR.

Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) applies to actuaries performing funding calculations related to a pension plan. ASOP 51 does not apply to actuaries performing services in connection with other post-employment benefits, such as medical benefits. Accordingly, ASOP 51 does not apply to the healthcare portion of JRS. See Section 5 of this report for further details regarding ASOP 51.

Use of Models

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to internally developed models that apply applicable funding methods and policies

to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal models are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal models, extra checking and review are completed. Significant changes to the internal models that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

Additional models used in valuing health benefits are described later in the report.

COVID-19

The potential impact of the ongoing COVID-19 pandemic on costs and liabilities was considered and an adjustment was made in setting the medical per capita claims cost assumption. FY20 medical claims were adjusted for a COVID-19 related decline in claims during the last four months (March – June) of FY20. A more detailed explanation on these adjustments is shown in Section 4.2.

This report was prepared under my supervision and in accordance with all applicable Actuarial Standards of Practice. I am a Fellow of the Society of Actuaries, an Enrolled Actuary, a Fellow of the Conference of Consulting Actuaries, and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

I am available to discuss this report with you at your convenience. I can be reached at 602-803-6174.

Respectfully submitted,

II KI

David J. Kershner, FSA, EA, MAAA, FCA

Principal

Buck

The undersigned actuary is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms his qualification to render opinions in such matters in accordance with the Qualification Standards of the American Academy of Actuaries.

Scott Young, FSA, EA, MAAA, FCA

Scott Young

Director

Buck

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Executive Summary

Overview

The State of Alaska Judicial Retirement System (JRS) provides pension and postemployment healthcare benefits to judicial and other eligible participants. The Commissioner of the Department of Administration is responsible for administering the plan. The Alaska Retirement Management Board has fiduciary responsibility over the assets of the plan. This report presents the results of the actuarial valuation of JRS as of the valuation date of June 30, 2020.

Purpose

An actuarial valuation is performed on the plan once every two years as of the end of the fiscal year, and roll-forward valuations are performed every other year. The main purposes of the actuarial valuation detailed in this report are:

- 1. To determine the Employer/State contribution necessary to meet the Board's funding policy for the plan;
- 2. To disclose the funding assets and liability measures as of the valuation date;
- 3. To review the current funded status of the plan and assess the funded status as an appropriate measure for determining future actuarially determined contributions;
- 4. To compare actual and expected experience under the plan during the fiscal year; and
- 5. To report trends in contributions, assets, liabilities, and funded status over the last several years.

The actuarial valuation provides a "snapshot" of the funded position of JRS based on the plan provisions, membership data, assets, and actuarial methods and assumptions as of the valuation date.

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Retiree group benefits models necessarily rely on the use of approximations and estimates, and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements.

Funded Status

Where presented, references to "funded ratio" and "unfunded actuarial accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

Fund	led Status as of June 30		2018	2020
Pens	ion			
a.	Actuarial Accrued Liability	\$	226,559,580	\$ 211,742,043
b.	Valuation Assets		178,489,284	 194,788,043
C.	Unfunded Actuarial Accrued Liability, (a) - (b)	\$	48,070,296	\$ 16,954,000
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)		78.8%	92.0%
e.	Fair Value of Assets	\$	176,794,969	\$ 189,844,025
f.	Funded Ratio based on Fair Value of Assets, (e) \div (a)		78.0%	89.7%
Heal	thcare			
a.	Actuarial Accrued Liability	\$	16,846,959	\$ 16,763,770
b.	Valuation Assets	_	31,868,079	 34,805,639
C.	Unfunded Actuarial Accrued Liability, (a) - (b)	\$	(15,021,120)	\$ (18,041,869)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)		189.2%	207.6%
e.	Fair Value of Assets	\$	31,497,603	\$ 34,036,503
f.	Funded Ratio based on Fair Value of Assets, (e) \div (a)		187.0%	203.0%
Total				
a.	Actuarial Accrued Liability	\$	243,406,539	\$ 228,505,813
b.	Valuation Assets		210,357,363	 229,593,682
C.	Unfunded Actuarial Accrued Liability, (a) - (b)	\$	33,049,176	\$ (1,087,869)
d.	Funded Ratio based on Valuation Assets, (b) \div (a)		86.4%	100.5%
e.	Fair Value of Assets	\$	208,292,572	\$ 223,880,528
f.	Funded Ratio based on Fair Value of Assets, (e) \div (a)		85.6%	98.0%

The key reasons for the change in the funded status are explained below. The funded status for healthcare benefits is not necessarily an appropriate measure to confirm that assets are sufficient to settle health plan obligations as there are no available financial instruments for purchase. Future experience is likely to vary from assumptions, so there is potential for actuarial gains or losses.

1. Investment Experience

The approximate investment returns based on fair value of assets were 6.0% for FY19 and 4.1% for FY20, compared to the expected investment return of 7.38% (net of investment expenses). This resulted in market asset losses of approximately \$3.1 million for FY19 and \$7.2 million for FY20. Due to the recognition of investment gains and losses over a 5-year period, the investment return based on actuarial value of assets were approximately 5.7% for FY19 and 5.9% for FY20.

2. Salary Increases

Salaries for active judges remained constant between June 30, 2018 and June 30, 2020 (excluding those who are pro tem), which resulted in a small liability loss of approximately \$0.4 million due to several judges moving to higher courts. The following table shows the annual base salaries for each of the court appointments:

	June 30, 2018	June 30, 2020
District Court	\$ 160,848	\$ 160,848
Superior Court	189,720	189,720
Appellate Court	193,836	193,836
Supreme Court	205,176	205,176
Administrative Director	189,720	189,720
Chief Justice	205,776	205,776
Pro Tem	160,857	N/A

3. Demographic Experience

Section 3 provides statistics on active and inactive participants. The number of active participants increased from 71 as of June 30, 2018 to 72 as of June 30, 2020. There were 22 new entrants and 18 retirements during this 2-year period. The average age of active participants decreased from 57.53 to 55.03, their average service decreased from 9.49 to 6.83, and their average entry age increased from 48.04 to 48.20.

The number of benefit recipients increased from 125 to 144, and their average age increased from 73.71 to 73.98. The number of vested terminated participants decreased from 3 to 2, and their average age decreased from 59.05 to 55.87.

The overall effect of the demographic experience was a liability gain of approximately \$0.4 million (pension) and a liability gain of approximately \$0.81 million (healthcare).

4. Retiree Medical Claims Experience

As described in Section 4.2, recent medical claims experience and changes in healthcare enrollment data provided to us for the June 30, 2020 valuation generated a liability gain of approximately \$2.3 million.

5. Changes in Methods Since the Prior Valuation

There were no changes in actuarial methods since the prior valuation.

6. Changes in Assumptions Since the Prior Valuation

Healthcare claim costs are updated annually as described in Section 4.2. The Further Consolidated Appropriations Act, 2020 that was signed in December 2019 made several changes, including the repeal of the Cadillac Tax. The repeal of the Cadillac Tax reduced the plan's liabilities as of June 30, 2020 by approximately \$0.2 million. The salary increase and pensioner benefit increase assumptions were modified to be 0% per year for FY21 through FY24, and 3.62% per year thereafter. The amounts included in Normal Cost for administrative expenses were updated based on the last two years of actual administrative expenses paid from plan assets. There were no other changes in actuarial assumptions since the prior valuation.

7. Changes in Benefit Provisions Since the Prior Valuation

There have been no changes in benefit provisions valued since the prior valuation.

¹ Includes the effect of changes in Medicare Part B only experience.

Comparative Summary of Contribution Rates

Pens	ion	FY 2021	FY 2023
a.	Normal Cost Rate Net of Member Contributions	42.04%	38.85%
b.	Past Service Cost Rate	<u>35.78%</u>	<u>24.74%</u>
C.	Total Employer/State Contribution Rate, (a) + (b), not less than (a)	77.82%	63.59%
Healt	hcare	FY 2021	FY 2023
a.	Normal Cost Rate	6.12%	6.49%
b.	Past Service Cost Rate	<u>(6.45)%</u>	<u>(8.24)%</u>
C.	Total Employer/State Contribution Rate, (a) + (b), not less than (a)	6.12%	6.49%
Total		FY 2021	FY 2023
a.	Normal Cost Rate Net of Member Contributions	48.16%	45.34%
b.	Past Service Cost Rate	<u>35.78%</u>	<u>24.74%</u>
C.	Total Employer/State Contribution Rate, (a) + (b), not less than (a)	83.94%	70.08%

The contribution rates for FY22 based on a roll-forward valuation as of June 30, 2019 were 70.97% (pension), 6.28% (healthcare), and 77.25% (total). These FY22 contribution rates reflect the change in the salary and pensioner benefit increase assumptions to 0% for FY19 and FY20 that were implemented for the June 30, 2019 roll-forward valuation.

Summary of Actuarial Accrued Liability Gain/(Loss) and Other Changes

The following table summarizes the sources of change in the total Employer/State contribution rates as of June 30, 2018, June 30, 2019, and June 30, 2020:

			Pension	Healthcare	Total
1.	Tot	al Employer/State Contribution Rate as of June 30, 2018	77.82%	6.12%	83.94%
2.	Cha	ange during FY19 ¹	(6.85)%	<u>0.16%</u>	(6.69)%
3.		al Employer/State Contribution Rate as of June 30, 2019 n Roll-Forward Valuation	70.97%	6.28%	77.25%
4.	Cha	ange due to:			
	a.	Investment Experience	1.38%	0.24%	1.62%
	b.	Demographic Experience, Health Claims Experience, and New Entrants ²	6.22%	(0.20)%	6.02%
	C.	State Appropriation	(2.46)%	0.00%	(2.46)%
	d.	Actual vs Expected Contributions	(0.74)%	(0.40)%	(1.14)%
	e.	Assumption Changes	(11.78)%	<u>0.57%</u>	<u>(11.21)%</u>
	f.	Total Change, (a) + (b) + (c) + (d) + (e)	(7.38)%	0.21%	(7.17)%
5.		ral Employer/State Contribution Rate as of June 30, 2020, + (4)(f)	63.59%	6.49%	70.08%

¹ Net effect of FY19 experience and assumption changes implemented effective June 30, 2019.

² Includes changes in future healthcare claims costs.

The following table shows the 2-year gain/(loss) on actuarial accrued liability as of June 30, 2020:

	Pension	Healthcare	Total
Retirement Experience	\$ (1,596,016)	\$ 341,768	\$ (1,254,248)
Termination Experience	534,735	(4,270)	530,465
Disability Experience	8,191	10,251	18,442
Active Mortality Experience	863,360	199,434	1,062,794
Inactive Mortality Experience	604,407	222,268	826,675
Salary Increases	(391,763)	N/A	(391,763)
New Entrants	(2,856,871)	(271,210)	(3,128,081)
Inactive Benefit Increases	(360,853)	N/A	(360,853)
Per Capita Claims Cost ¹	N/A	2,287,097	2,287,097
Cadillac Tax Repeal	N/A	234,431	234,431
Medicare Part B Only Experience	N/A	8,972	8,972
Programming Changes ²	(297,054)	N/A	(297,054)
Miscellaneous ³	(583,293)	(488,418)	(1,071,711)
Total	\$ (4,075,157)	\$ 2,540,323	\$ (1,534,834)

Other items that increased/(decreased) the actuarial accrued liability as of June 30, 2020 are shown below:

	Pension	Healthcare		Total
Salary Increase Assumption Change	\$ (5,817,208)	\$	200,955	\$ (5,616,253)
Pensioner Benefit Increase Assumption Change	(15,787,045)		N/A	(15,787,045)
Total	\$(21,604,253)	\$	200,955	\$(21,403,298)

¹ Includes the estimated impact of COVID-19 on claims experience during FY20.

² Adjustments to required member contributions for service over 15 years.

Includes the effects of various data changes that are typical when new census data is received for the valuation, the effects of the differences between expected and actual benefit payments, and other items that do not fit neatly into any of the other categories.

Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost

As of June 30, 2020	esent Value of jected Benefits	Actuarial Accrued (Past Service) Liability		
Active Members				
Retirement Benefits	\$ 79,273,487	\$	44,430,929	
Disability Benefits	139,271		5,214	
Death Benefits	1,133,173		449,575	
Termination Benefits ¹	2,667,758		124,428	
Medical and Prescription Drug Benefits	12,431,669		5,970,520	
Medicare Part D Subsidy	 (1,581,787)		(814,234)	
Subtotal	\$ 94,063,571	\$	50,166,432	
Benefit Recipients				
Retiree Benefits	\$ 147,826,070	\$	147,826,070	
Survivor Benefits	16,628,123		16,628,123	
Disability Benefits	0		0	
Medical and Prescription Drug Benefits	13,027,288		13,027,288	
Medicare Part D Subsidy	 (1,984,248)		(1,984,248)	
Subtotal	\$ 175,497,233	\$	175,497,233	
Vested Terminations				
Deferred Retirement Benefits	\$ 2,210,876	\$	2,210,876	
Medical and Prescription Drug Benefits	628,029		628,029	
Medicare Part D Subsidy	 (63,585)		(63,585)	
Subtotal	\$ 2,775,320	\$	2,775,320	
Non-Vested Terminations	\$ 66,828	\$	66,828	
Total	\$ 272,402,952	\$	228,505,813	
Total Pension	\$ 249,945,586	\$	211,742,043	
Total Medical, Net of Part D Subsidy	\$ 22,457,366	\$	16,763,770	
Total Medical, Gross of Part D Subsidy	\$ 26,086,986	\$	19,625,837	

¹ Includes return of contributions.

As of June 30, 2020	N	Normal Cost		
Active Members		_		
Retirement Benefits	\$	5,420,771		
Disability Benefits		17,019		
Death Benefits		116,491		
Termination Benefits ¹		296,645		
Medical and Prescription Drug Benefits		944,871		
Medicare Part D Subsidy		(114,944)		
Administrative Expenses (Pension)		83,000		
Administrative Expenses (Medical)		24,000		
Total	\$	6,787,853		
Total Pension	\$	5,933,926		
Total Medical, Net of Part D Subsidy	\$	853,927		
Total Medical, Gross of Part D Subsidy	\$	968,871		

¹ Includes return of contributions.

Section 1.2: Actuarial Contributions as of June 30, 2020 (for FY23)

Normal Cost Rate		Pension		Healthcare		Total	
1. Total Normal Cost	\$	5,933,926	\$	853,927	\$	6,787,853	
2. Base Salaries for Upcoming Fiscal Year		13,157,172		13,157,172		13,157,172	
3. Normal Cost Rate, (1) ÷ (2)		45.10%		6.49%		51.59%	
4. Average Member Contribution Rate		6.25%		0.00%		6.25%	
5. Employer Normal Cost Rate, (3) - (4)		38.85%		6.49%		45.34%	

Past Service Rate		Pension		Healthcare		Total
1. Actuarial Accrued Liability	\$	211,742,043	\$	16,763,770	\$	228,505,813
2. Valuation Assets		194,788,043		34,805,639		229,593,682
3. Unfunded Actuarial Accrued Liability, (1) - (2)	\$	16,954,000	\$	(18,041,869)	\$	(1,087,869)
4. Funded Ratio, (2) ÷ (1)		92.0%		207.6%		100.5%
5. Past Service Cost Amortization Payment		3,255,457		(1,084,030)		2,171,427
6. Base Salaries for Upcoming Fiscal Year		13,157,172		13,157,172		13,157,172
7. Past Service Rate, (5) ÷ (6)		24.74%		(8.24%)		16.50%
Total Employer Contribution Rate, not less than Normal Cost Rate		63.59%		6.49%		70.08%

Schedule of Past Service Cost Amortizations - Pension

	Amortization Period		Bala	Balances			
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of- Year Payment		
Initial Unfunded Liability ¹	6/30/2002	7	\$ 5,864,449	\$ 4,384,187	\$ 712,082		
FY03/04 Loss ¹	6/30/2004	9	855,068	730,589	96,203		
Revaluation of Liabilities ¹	6/30/2005	10	9,115,451	8,160,665	987,161		
FY05/06 Loss ¹	6/30/2006	11	18,186,558	16,891,313	1,895,695		
FY07 Loss	6/30/2007	12	1,364,721	1,305,006	136,992		
FY08 Gain	6/30/2008	13	(29,014,739)	(28,400,811)	(2,807,678)		
FY09 Loss	6/30/2009	14	21,273,454	21,192,254	1,984,432		
Change in Assumptions	6/30/2010	15	13,976,981	14,100,026	1,256,823		
FY10 Loss	6/30/2010	15	6,474,780	6,531,779	582,218		
FY11 Loss	6/30/2011	16	7,397,917	7,541,369	642,636		
FY12 Loss	6/30/2012	17	11,916,371	12,228,693	999,970		
FY13 Loss	6/30/2013	18	7,033,497	6,997,991	550,946		
Change in Assumptions	6/30/2014	19	4,219,851	4,346,623	330,439		
FY14 Gain	6/30/2014	19	(14,458,986)	(14,893,369)	(1,132,223)		
FY15 Gain	6/30/2015	20	(3,325,706)	(3,417,930)	(251,560)		
FY16 Gain	6/30/2016	21	(9,932,623)	(10,161,088)	(725,736)		
FY17 Gain	6/30/2017	22	(1,137,538)	(1,155,882)	(80,284)		
Change in Assumptions	6/30/2018	23	10,343,783	10,419,795	705,155		
FY18 Gain	6/30/2018	23	(12,096,419)	(12,185,312)	(824,636)		
Change in Assumptions	6/30/2019	24	(14,775,890)	(14,841,835)	(980,341)		
FY19 Loss	6/30/2019	24	3,344,559	3,359,485	221,902		
Change in Assumptions	6/30/2020	25	(21,604,253)	(21,604,253)	(1,395,021)		
FY20 Loss	6/30/2020	25	5,424,705	5,424,705	350,282		
Total				\$ 16,954,000	\$ 3,255,457		

¹ The pension and healthcare split was done based on the ratio of unfunded actuarial accrued liability as of June 30, 2006.

Schedule of Past Service Cost Amortizations - Healthcare

	Amortization Period		Balances			
Layer	Date Created	Years Remaining	Initial	Outstanding		eginning-of- ear Payment
Initial Unfunded Liability ¹	6/30/2002	7	\$ 2,295,257	\$ 1,715,906	\$	278,698
FY03/04 Loss ¹	6/30/2004	9	334,660	285,940		37,652
Revaluation of Liabilities ¹	6/30/2005	10	3,567,649	3,193,959		386,360
FY05/06 Loss ¹	6/30/2006	11	7,117,943	6,611,004		741,946
FY07 Gain	6/30/2007	12	(810,073)	(774,628)		(81,316)
Change in Assumptions	6/30/2008	13	789,072	772,377		76,356
FY08 Gain	6/30/2008	13	(14,011,596)	(13,715,124)		(1,355,865)
FY09 Loss	6/30/2009	14	901,355	897,917		84,081
Change in Assumptions	6/30/2010	15	2,006,196	2,023,857		180,399
FY10 Gain	6/30/2010	15	(1,930,656)	(1,947,650)		(173,606)
FY11 Loss	6/30/2011	16	550,376	561,048		47,810
Change in Assumptions	6/30/2012	17	353,605	362,871		29,673
FY12 Gain	6/30/2012	17	(5,516,210)	(5,660,789)		(462,896)
FY13 Loss	6/30/2013	18	226,259	232,968		18,341
Change in Assumptions	6/30/2014	19	772,305	795,506		60,476
FY14 Gain	6/30/2014	19	(3,342,464)	(3,442,880)		(261,734)
FY15 Gain	6/30/2015	20	(1,416,996)	(1,456,290)		(107,183)
Change in Method	6/30/2016	21	(3,567,789)	(3,649,854)		(260,684)
FY16 Gain	6/30/2016	21	(425,711)	(435,503)		(31,105)
FY17 Gain	6/30/2017	22	(586,113)	(595,565)		(41,366)
Change in Assumptions/Methods/EGWP	6/30/2018	23	1,009,960	1,017,381		68,851
FY18 Gain	6/30/2018	23	(2,148,478)	(2,164,265)		(146,466)
Change in Assumptions	6/30/2019	24	126,754	127,319		8,410
FY19 Gain	6/30/2019	24	(155,028)	(155,719)		(10,286)
Change in Assumptions	6/30/2020	25	200,955	200,955		12,976
FY20 Gain	6/30/2020	25	(2,842,610)	(2,842,610)		(183,552)
Total				\$(18,041,869)	\$	(1,084,030)

¹ The pension and healthcare split was done based on the ratio of unfunded actuarial accrued liability as of June 30, 2006.

Schedule of Past Service Cost Amortizations - Total

	Amortization Period		Bala	nces	
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of- Year Payment
Initial Unfunded Liability	6/30/2002	7	\$ 8,159,706	\$ 6,100,093	\$ 990,780
FY03/04 Loss	6/30/2004	9	1,189,728	1,016,529	133,855
Revaluation of Liabilities	6/30/2005	10	12,683,100	11,354,624	1,373,521
FY05/06 Loss	6/30/2006	11	25,304,501	23,502,317	2,637,641
FY07 Loss	6/30/2007	12	554,648	530,378	55,676
Change in Assumptions	6/30/2008	13	789,072	772,377	76,356
FY08 Gain	6/30/2008	13	(43,026,335)	(42,115,935)	(4,163,543)
FY09 Loss	6/30/2009	14	22,174,809	22,090,171	2,068,513
Change in Assumptions	6/30/2010	15	15,983,177	16,123,883	1,437,222
FY10 Loss	6/30/2010	15	4,544,124	4,584,129	408,612
FY11 Loss	6/30/2011	16	7,948,293	8,102,417	690,446
Change in Assumptions	6/30/2012	17	353,605	362,871	29,673
FY12 Loss	6/30/2012	17	6,400,161	6,567,904	537,074
FY13 Loss	6/30/2013	18	7,259,756	7,230,959	569,287
Change in Assumptions	6/30/2014	19	4,992,156	5,142,129	390,915
FY14 Gain	6/30/2014	19	(17,801,450)	(18,336,249)	(1,393,957)
FY15 Gain	6/30/2015	20	(4,742,702)	(4,874,220)	(358,743)
Change in Method	6/30/2016	21	(3,567,789)	(3,649,854)	(260,684)
FY16 Gain	6/30/2016	21	(10,358,334)	(10,596,591)	(756,841)
FY17 Gain	6/30/2017	22	(1,723,651)	(1,751,447)	(121,650)
Change in Assumptions/Methods/EGWP	6/30/2018	23	11,353,743	11,437,176	774,006
FY18 Gain	6/30/2018	23	(14,244,897)	(14,349,577)	(971,102)
Change in Assumptions	6/30/2019	24	(14,649,136)	(14,714,516)	(971,931)
FY19 Loss	6/30/2019	24	3,189,531	3,203,766	211,616
Change in Assumptions	6/30/2020	25	(21,403,298)	(21,403,298)	(1,382,045)
FY20 Loss	6/30/2020	25	2,582,095	2,582,095	166,730
Total				\$ (1,087,869)	\$ 2,171,427

Section 1.3: Actuarial Gain/(Loss) for FY20

	Pension	Healthcare	Total
Expected Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of June 30, 2019	\$ 221,159,289	\$ 18,089,100	\$ 239,248,389
b. Normal Cost	6,077,783	819,372	6,897,155
c. Interest on (a) and (b) at 7.38%	16,770,096	1,395,445	18,165,541
d. Employer Group Waiver Plan	0	108,886	108,886
e. Benefit Payments	(14,178,500)	(1,267,667)	(15,446,167)
f. Refund of Contributions	0	0	0
g. Interest on (d) thru (f) at 7.38%, adjusted for timing	(557,529)	(41,998)	(599,527)
h. Assumptions/Methods Changes	(21,604,253)	200,955	(21,403,298)
i. Expected Actuarial Accrued Liability as of June 30, 2020 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	\$ 207,666,886	\$ 19,304,093	\$ 226,970,979
2. Actual Actuarial Accrued Liability as of June 30, 2020	211,742,043	16,763,770	228,505,813
3. Liability Gain/(Loss), (1)(i) - (2)	\$ (4,075,157)	\$ 2,540,323	\$ (1,534,834)
4. Expected Actuarial Asset Value			
a. Actuarial Value of Assets as of June 30, 2019	\$ 186,117,830	\$ 33,319,896	\$ 219,437,726
b. Interest on (a) at 7.38%	13,735,496	2,459,008	16,194,504
c. Employee Contributions	838,676	0	838,676
d. Employer Contributions	6,117,144	730,363	6,847,507
e. State Appropriation	5,010,000	0	5,010,000
f. Employer Group Waiver Plan	0	108,886	108,886
g. Interest on (c) thru (f) at 7.38%, adjusted for timing	621,839	30,417	652,256
h. Benefit Payments	(14,178,500)	(1,267,667)	(15,446,167)
i. Refund of Contributions	0	0	0
j. Administrative Expenses	(106,618)	(29,092)	(135,710)
k. Interest on (h) thru (j) at 7.38%, adjusted for timing	(561,393)	(46,999)	(608,392)
I. Expected Actuarial Asset Value as of June 30, 2020 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h) + (i) + (j) + (k)	\$ 197,594,474	\$ 35,304,812	\$ 232,899,286
5. Actual Actuarial Asset Value as of June 30, 2020	194,788,043	34,805,639	229,593,682
6. Actuarial Asset Value Gain/(Loss), (5) - (4)(I)	\$ (2,806,431)	\$ (499,173)	\$ (3,305,604)
7. Total Actuarial Gain/(Loss), (3) + (6)	\$ (6,881,588)	\$ 2,041,150	\$ (4,840,438)
8. Contribution Gain/(Loss)	\$ 1,501,863	\$ 808,412	\$ 2,310,275
9. Administrative Expense Gain/(Loss)	\$ (44,980)	\$ (6,952)	\$ (51,932)
10. FY20 Gain/(Loss), (7) + (8) + (9)	\$ (5,424,705)	\$ 2,842,610	\$ (2,582,095)

Section 1.4: Development of Change in Unfunded Liability During FY20

	Pension	Healthcare	Total
2019 Unfunded Liability	\$ 35,041,459	\$ (15,230,796)	\$ 19,810,663
a. Interest on Unfunded Liability at 7.38%	\$ 2,586,060	\$ (1,124,032)	\$ 1,462,028
b. Normal Cost	6,077,783	819,372	6,897,155
c. Employee Contributions	(838,676)	0	(838,676)
d. Employer Contributions	(6,117,144)	(730,363)	(6,847,507)
e. State Appropriation	(5,010,000)	0	(5,010,000)
f. Administrative Expenses	106,618	29,092	135,710
g. Interest on (b) thru (f) at 7.38%, adjusted for timing	(169,435)	35,053	(134,382)
h. Assumptions/Methods Changes	(21,604,253)	200,955	(21,403,298)
i. Expected Change in Unfunded Liability During FY20 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	\$ (24,969,047)	\$ (769,923)	\$ (25,738,970)
2. Expected 2020 Unfunded Liability, (1) + (1)(i)	\$ 10,072,412	\$ (16,000,719)	\$ (5,928,307)
a. Liability (Gain)/Loss During FY20	\$ 4,075,157	\$ (2,540,323)	\$ 1,534,834
b. Actuarial Assets (Gain)/Loss During FY20	2,806,431	499,173	3,305,604
c. Total Actuarial (Gain)/Loss During FY20	\$ 6,881,588	\$ (2,041,150)	\$ 4,840,438
3. Actual 2020 Unfunded Liability, (2) + (2)(c)	\$ 16,954,000	\$ (18,041,869)	\$ (1,087,869)

Section 1.5: History of Unfunded Liability and Funded Ratio

Valuation Date	Total Actuarial Accrued Liability	Valuation Assets	Assets as a Percent of Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability (UAAL)
June 30, 2000	\$ 73,483,475	\$ 72,660,197	98.9%	\$ 823,278
June 30, 2002	71,843,615	63,683,909	88.6%	8,159,706
June 30, 2004	80,052,559	70,455,634	88.0%	9,596,925
June 30, 2006	127,725,758	79,710,103	62.4%	48,015,655
June 30, 2007	133,988,906	84,773,226	63.3%	49,215,680
June 30, 2008	148,737,880	141,235,655	95.0%	7,502,225
June 30, 2009	156,679,506	127,173,616	81.2%	29,505,890
June 30, 2010	184,828,106	134,694,195	72.9%	50,133,911
June 30, 2011	194,831,317	136,546,204	70.1%	58,285,113
June 30, 2012	198,922,147	133,706,032	67.2%	65,216,115
June 30, 2013	209,088,146	136,738,696	65.4%	72,349,450
June 30, 2014	211,638,218	152,078,765	71.9%	59,559,453
June 30, 2015	223,465,344	168,991,184	75.6%	54,474,160
June 30, 2016	221,279,249	181,343,343	82.0%	39,935,906
June 30, 2017	233,547,391	196,344,239	84.1%	37,203,152
June 30, 2018	243,406,539	210,357,363	86.4%	33,049,176
June 30, 2019	239,248,389	219,437,726	91.7%	19,810,663
June 30, 2020	228,505,813	229,593,682	100.5%	(1,087,869)

Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets

As of June 30, 2020	Pension	Healthcare	Total	Allocation Percent
Cash and Short-Term Investments				
- Cash and Cash Equivalents	\$ 2,148,409	\$ 359,625	\$ 2,508,034	1.1%
- Subtotal	\$ 2,148,409	\$ 359,625	\$ 2,508,034	1.1%
Fixed Income Investments				
- Domestic Fixed Income Pool	\$ 40,901,403	\$ 7,376,882	\$ 48,278,285	21.6%
- International Fixed Income Pool	0	0	0	0.0%
- Tactical Fixed Income Pool	0	0	0	0.0%
- High Yield Pool	0	0	0	0.0%
- Treasury Inflation Protection Pool	0	0	0	0.0%
- Emerging Debt Pool	0	0	0	0.0%
- Subtotal	\$ 40,901,403	\$ 7,376,882	\$ 48,278,285	21.6%
Equity Investments				
- Domestic Equity Pool	\$ 51,520,155	\$ 9,292,639	\$ 60,812,794	27.2%
- International Equity Pool	29,397,287	5,302,359	34,699,646	15.5%
- Private Equity Pool	23,312,273	4,204,811	27,517,084	12.3%
- Emerging Markets Equity Pool	6,147,320	1,108,786	7,256,106	3.2%
- Alternative Equity Strategies	10,254,995	1,849,683	12,104,678	5.4%
- Subtotal	\$ 120,632,030	\$ 21,758,278	\$ 142,390,308	63.8%
Other Investments				
- Real Estate Pool	\$ 11,604,002	\$ 2,097,294	\$ 13,701,296	6.1%
- Other Investments Pool	13,892,173	2,505,717	16,397,890	7.3%
- Absolute Return Pool	0	0	0	0.0%
- Other Assets	0	3,076	3,076	0.0%
- Subtotal	\$ 25,496,175	\$ 4,606,087	\$ 30,102,262	13.5%
Total Cash and Investments	\$ 189,178,017	\$ 34,100,872	\$ 223,278,889	100.0%
Net Accrued Receivables	666,008	(64,369)	601,639	
Net Assets	\$ 189,844,025	\$ 34,036,503	\$ 223,880,528	

Section 2.2: Changes in Fair Value of Assets During FY19

Fiscal Year 2019	Pension	Healthcare	Total
1. Fair Value of Assets as of June 30, 2018	\$ 176,794,969	\$ 31,497,603	\$ 208,292,572
2. Additions:			
a. Employee Contributions	\$ 813,374	\$ 0	\$ 813,374
b. Employer Contributions	5,347,675	591,397	5,939,072
c. State Appropriation	4,909,000	0	4,909,000
d. Interest and Dividend Income	3,305,189	589,436	3,894,625
e. Net Appreciation / Depreciation in Fair Value of Investments	7,216,458	1,324,956	8,541,414
f. Employer Group Waiver Plan	0	96,542	96,542
g. Other	0	2,291	2,291
h. Total Additions	\$ 21,591,696	\$ 2,604,622	\$ 24,196,318
3. Deductions:			
a. Medical Benefits	\$ 0	\$ 978,813	\$ 978,813
b. Retirement Benefits	13,627,946	0	13,627,946
c. Refund of Contributions	0	0	0
d. Investment Expenses	73,807	13,136	86,943
e. Administrative Expenses	59,094	17,950	77,044
f. Total Deductions	\$ 13,760,847	\$ 1,009,899	\$ 14,770,746
4. Fair Value of Assets as of June 30, 2019	\$ 184,625,818	\$ 33,092,326	\$ 217,718,144
Approximate Fair Value Investment Return Rate during FY19 Net of Investment Expenses	6.0%	6.1%	6.0%

Section 2.3: Changes in Fair Value of Assets During FY20

Fiscal Year 2020	Pension	Healthcare	Total
1. Fair Value of Assets as of June 30, 2019	\$ 184,625,818	\$ 33,092,326	\$ 217,718,144
2. Additions:			
a. Employee Contributions	\$ 838,676	\$ 0	\$ 838,676
b. Employer Contributions	6,117,144	730,363	6,847,507
c. State Appropriation	5,010,000	0	5,010,000
d. Interest and Dividend Income	2,862,234	510,170	3,372,404
e. Net Appreciation / Depreciation in Fair Value of Investments	5,220,577	962,611	6,183,188
f. Employer Group Waiver Plan	0	108,886	108,886
g. Other	0	23,956	23,956
h. Total Additions	\$ 20,048,631	\$ 2,335,986	\$ 22,384,617
3. Deductions:			
a. Medical Benefits	\$ 0	\$ 1,267,667	\$ 1,267,667
b. Retirement Benefits	14,178,500	0	14,178,500
c. Refund of Contributions	0	0	0
d. Investment Expenses	545,306	95,050	640,356
e. Administrative Expenses	106,618	29,092	135,710
f. Total Deductions	\$ 14,830,424	\$ 1,391,809	\$ 16,222,233
4. Fair Value of Assets as of June 30, 2020	\$ 189,844,025	\$ 34,036,503	\$ 223,880,528
Approximate Fair Value Investment Return Rate during FY20 Net of Investment Expenses	4.1%	4.3%	4.1%

Section 2.4: Development of Actuarial Value of Assets

Investment gains and losses are recognized 20% per year over 5 years. In no event may valuation assets be less than 80% or more than 120% of fair value as of the current valuation date.

		Pension	Healthcare	Total
1.	Deferral of Investment Gain / (Loss) for FY20			
	a. Fair Value of Assets as of June 30, 2019	\$ 184,625,818	\$ 33,092,326	\$ 217,718,144
	b. Contributions	11,965,820	730,363	12,696,183
	c. Employer Group Waiver Plan	0	108,886	108,886
	d. Benefit Payments	14,178,500	1,267,667	15,446,167
	e. Administrative Expenses	106,618	29,092	135,710
	f. Actual Investment Return (net of investment expenses)	7,537,505	1,401,687	8,939,192
	g. Expected Return Rate (net of investment expenses)	7.38%	7.38%	7.38%
	h. Expected Return, Weighted for Timing	13,685,832	2,425,632	16,111,464
	i. Investment Gain / (Loss) for the Year, (f) - (h)	(6,148,327)	(1,023,945)	(7,172,272)
2.	Actuarial Value as of June 30, 2020			
	a. Fair Value as of June 30, 2020	\$ 189,844,025	\$ 34,036,503	\$ 223,880,528
	b. Deferred Investment Gain / (Loss)	(4,944,018)	(769,136)	(5,713,154)
	c. Preliminary Actuarial Value as of June 30, 2020, (a) - (b)	194,788,043	34,805,639	229,593,682
	d. Upper Limit: 120% of Fair Value as of June 30, 2020	227,812,830	40,843,804	268,656,634
	e. Lower Limit: 80% of Fair Value as of June 30, 2020	151,875,220	27,229,202	179,104,422
	f. Actuarial Value at June 30, 2020, (c) limited by (d) and (e)	194,788,043	34,805,639	229,593,682
3.	Ratio of Actuarial Value of Assets to Fair Value of Assets	102.6%	102.3%	102.6%
4.	Approximate Actuarial Value Investment Return Rate during FY20 Net of Investment Expenses	5.9%	5.9%	5.9%

The tables below show the development of the gains/(losses) to be recognized in the current year:

Pension					
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years	
June 30, 2016	\$ (12,208,288)	\$ (9,766,632)	\$ (2,441,656)	\$ 0	
June 30, 2017	7,229,597	4,337,757	1,445,920	1,445,920	
June 30, 2018	292,590	117,036	58,518	117,036	
June 30, 2019	(2,647,188)	(529,438)	(529,438)	(1,588,312)	
June 30, 2020	(6,148,327)	0	(1,229,665)	(4,918,662)	
Total	\$ (13,481,616)	\$ (5,841,277)	\$ (2,696,321)	\$ (4,944,018)	

		Healthcare			
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years	
June 30, 2016	\$ (2,359,113)	\$ (1,887,292)	\$ (471,821)	\$ 0	
June 30, 2017	1,282,441	769,464	256,488	256,489	
June 30, 2018	98,500	39,400	19,700	39,400	
June 30, 2019	(409,783)	(81,957)	(81,957)	(245,869)	
June 30, 2020	(1,023,945)	0	(204,789)	(819,156)	
Total	\$ (2,411,900)	\$ (1,160,385)	\$ (482,379)	\$ (769,136)	

		Total		
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2016	\$ (14,567,401)	\$ (11,653,924)	\$ (2,913,477)	\$ 0
June 30, 2017	8,512,038	5,107,221	1,702,408	1,702,409
June 30, 2018	391,090	156,436	78,218	156,436
June 30, 2019	(3,056,971)	(611,395)	(611,395)	(1,834,181)
June 30, 2020	(7,172,272)	0	(1,434,454)	(5,737,818)
Total	\$ (15,893,516)	\$ (7,001,662)	\$ (3,178,700)	\$ (5,713,154)

Section 2.5: Historical Asset Rates of Return

	Actual	rial Value	Fair Value			
Year Ending	Annual	Cumulative*	Annual	Cumulative*		
June 30, 2005	8.0%	8.0%	8.0%	8.0%		
June 30, 2006	11.0%	9.5%	11.0%	9.5%		
June 30, 2007	10.2%	9.7%	18.1%	12.3%		
June 30, 2008	7.4%	9.1%	(4.8%)	7.7%		
June 30, 2009	(9.7%)	5.1%	(20.6%)	1.4%		
June 30, 2010	8.7%	5.7%	10.6%	2.8%		
June 30, 2011	5.0%	5.6%	20.8%	5.2%		
June 30, 2012	0.7%	5.0%	0.1%	4.6%		
June 30, 2013	3.6%	4.8%	12.3%	5.4%		
June 30, 2014	12.2%	5.5%	18.3%	6.6%		
June 30, 2015	10.8%	6.0%	3.0%	6.3%		
June 30, 2016	6.6%	6.0%	(0.5%)	5.7%		
June 30, 2017	8.3%	6.2%	13.0%	6.3%		
June 30, 2018	8.1%	6.3%	8.3%	6.4%		
June 30, 2019	5.7%	6.3%	6.0%	6.4%		
June 30, 2020	5.9%	6.3%	4.1%	6.2%		

^{*} Cumulative since fiscal year ending June 30, 2005

Section 3: Member Data

Section 3.1: Summary of Members Included

As of June 30		2012 2		2014	2016			2018		2020
Active Members										
1. Number		69		76		76		71		72
2. Average Age		57.83		57.65		58.80		57.53		55.03
3. Average Service		9.04		8.70		9.39		9.49		6.83
4. Average Entry Age		48.79		48.95		49.41		48.04		48.20
5. Average Annual Earnings	\$	171,060	\$	175,964	\$	178,903	\$	182,045	\$	182,739
6. Number Vested		43		48		54		51		36
7. Percent Who Are Vested		62.3%		63.2%		71.1%		71.8%		50.0%
Retirees, Disabilitants, and Benefic	iario	es								
1. Number		108		108		109		125		144
2. Average Age		70.95		72.09		73.34		73.71		73.98
3. Average Monthly Pension Benefit	\$	7,774	\$	8,141	\$	8,529	\$	8,291	\$	8,305
Vested Terminations (vested at term	nina	ation, not re	fund	ed contribu	tions	, or comme	enced	l benefit)		
1. Number		5		4		3		3		2
2. Average Age		52.28		53.53		57.35		59.05		55.87
3. Average Monthly Pension Benefit	\$	5,937	\$	5,704	\$	7,017	\$	7,623	\$	6,305
Non-Vested Terminations (not veste	ed a	at terminatio	on, no	ot refunded	cont	ributions)				
1. Number		0		0		0		0		1
2. Average Account Balance	\$	0	\$	0	\$	0	\$	0	\$	66,828
Total Number of Members		182		188		188		199		219

As of June 30, 2020	Retirees
Summary of Retiree Medical Data Received	
1. Retiree records on pension data	144
2. Remove duplicates on pension data	(5)
3. Valued in a different retiree healthcare plan	(49)
4. Records without medical coverage	(1)
5 Total	89

Section 3.2: Age and Service Distribution of Active Members

Annual Earnings by Age

Total **Average** Annual **Annual** Age Number **Earnings Earnings** \$ 0 - 19 0 0 0 20 - 24 0 0 0 25 - 29 0 0 0 30 - 34 0 0 0 35 - 39 2 350,568 175,284 40 - 44 9 1,653,852 183,761 45 - 49 10 1,814,700 181,470 50 - 54 17 3,084,996 181,470 55 - 59 12 2,147,736 178,978 60 - 64 11 2,029,176 184,471 65 - 69 2,076,144 188,740 11 70 - 74 0 0 0 0 75+ 0 0

Annual Earnings by Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	8	\$ 1,460,016	\$ 182,502
1	14	2,598,336	185,595
2	6	1,051,704	175,284
3	5	923,844	184,769
4	3	584,616	194,872
0 - 4	36	\$ 6,618,516	\$ 183,848
5 - 9	16	2,914,848	182,178
10 - 14	12	2,205,480	183,790
15 - 19	6	1,051,704	175,284
20 - 24	2	366,624	183,312
25 - 29	0	0	0
30 - 34	0	0	0
35 - 39	0	0	0
40+	0	0	0

\$ 13,157,172

182,739

Total 72 \$ 13,157,172 \$ 182,739

Years of Service by Age

					Vaara	. Comico				
_					rears o	f Service				
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0	0
30 - 34	0	0	0	0	0	0	0	0	0	0
35 - 39	2	0	0	0	0	0	0	0	0	2
40 - 44	6	3	0	0	0	0	0	0	0	9
45 - 49	8	2	0	0	0	0	0	0	0	10
50 - 54	10	4	0	3	0	0	0	0	0	17
55 - 59	5	2	4	0	1	0	0	0	0	12
60 - 64	4	3	3	1	0	0	0	0	0	11
65 - 69	1	2	5	2	1	0	0	0	0	11
70 - 74	0	0	0	0	0	0	0	0	0	0
75+	0	0	0	0	0	0	0	0	0	0
Total	36	16	12	6	2	0	0	0	0	72

Total

72

Section 3.3: Member Data Reconciliation

Pension

		Inactive Members					
	Active Members	Due a Refund	Deferred Benefits	Benefit Recipients	Total		
As of June 30, 2018	71	0	3	125	199		
New Entrants	22	0	0	0	22		
Rehires	0	0	0	0	0		
Vested Terminations	(1)	0	1	0	0		
Non-Vested Terminations	(1)	1	0	0	0		
Refund of Contributions	0	0	0	0	0		
Retirements	(18)	0	(2)	20	0		
Deceased	(1)	0	0	(8)	(9)		
New Beneficiaries	0	0	0	6	6		
New QDROs	0	0	0	2	2		
Transfers In/Out	0	0	0	0	0		
Data Corrections	0	0	0	(1)	(1)		
Net Change	1	1	(1)	19	20		
As of June 30, 2020	72	1	2	144	219		

Healthcare

		Inactive Members							
	Active Members	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members			
As of June 30, 2018	56	78	40	5	3	126			
New Entrants	13	0	0	0	0	0			
Rehires	0	0	0	0	0	0			
Vested Terminations	(1)	0	0	0	1	1			
Non-Vested Terminations	(1)	0	0	0	0	0			
Refund of Contributions	0	0	0	0	0	0			
Disability Retirements	0	0	0	0	0	0			
Age Retirements	(10)	10	4	0	0	14			
Deferred Retirements	0	2	0	0	(2)	0			
Deceased	(1)	(5)	0	0	0	(5)			
New Beneficiaries	0	3	(3)	0	0	0			
Added Retiree Medical Coverage	0	0	0	0	0	0			
Added Dependent Coverage	0	0	0	0	0	0			
Dropped Retiree Medical Coverage	0	0	0	0	0	0			
Dropped Dependent Coverage	0	0	(2)	(1)	0	(3)			
Transfers In/Out	0	1	0	0	0	1			
Net Change	0	11	(1)	(1)	(1)	8			
As of June 30, 2020	56	89	39	4	2	134			

Section 4: Basis of the Actuarial Valuation

Section 4.1: Summary of Plan Provisions

Effective Date

May 4, 1963, with amendments through June 30, 2020.

Administration of Plan

The Commissioner of Administration is responsible for administering the Judicial Retirement System (JRS). The Alaska Retirement Management Board is responsible for managing and investing the fund.

Membership

Membership in JRS is mandatory for all Supreme Court justices and Superior, District, and Appellate Court judges. The administrative director of the Court System may elect to participate in either JRS or Public Employees' Retirement System (PERS).

Credited Service

Members receive credit for each day of JRS employment. Earlier service as a magistrate or deputy magistrate before July 1, 1967 is covered under JRS. JRS members become vested in the plan after completing five years of credited service.

Member Contributions

Mandatory Contributions: Members hired after July 1, 1978, are required to contribute 7% of their base salaries. Contributions are required for a maximum of 15 years. Members hired before July 1, 1978 are not required to contribute.

Interest: Members' contributions earn 4.5% interest, compounded semiannually on June 30 and December 31.

Refund of Contributions: Non-vested members may receive a refund of their contributions and interest earned if they terminate employment. Refunded contributions, plus 7% indebtedness interest, must be repaid before appointment to retirement.

JRS contributions for terminated members may be attached to satisfy claims under Alaska Statute 09.38.065 or federal tax levies. Contributions that are attached to satisfy claims or tax levies may be reinstated at any time. The member is not required to return to JRS employment.

Retirement Benefits

Normal Retirement: Members are eligible for normal retirement at age 60 if they have at least five years of JRS service. Terminated, vested members may defer retirement and begin receiving normal retirement benefits when they reach age 60. Vesting is completion of at least five years of JRS service.

Early Retirement: Members are eligible for early retirement at any age if they have at least 20 years of service. Terminated, vested members may defer retirement and begin receiving early retirement benefits when they reach age 55. Under early retirement, members receive reduced benefits equal to the actuarial equivalent of their normal retirement benefits. Early benefits are based on the member's service and early retirement date.

Benefit Type: Lifetime monthly benefits are paid to the member. Upon the member's death, a survivor's benefit (see below) may be payable if the member has an eligible spouse or dependent children.

Benefit Calculations for Normal Retirement: 5% of authorized monthly base salary for each year of JRS service up to a maximum of 15 years. JRS retirement benefit payments are recalculated when the salary for the office held by the member at the time of retirement changes. The maximum JRS benefit payable to a member is 75% of the authorized salary.

Disability Benefits

Members are eligible to receive monthly disability benefits at any age if they become incapacitated and they have at least two years of JRS service. Disability benefits are calculated the same as normal retirement benefits.

Survivor's Benefits

Survivor's benefits are payable to the spouse of a member if they have been married for at least one year immediately preceding the member's death and the member has at least two years of JRS service. The monthly survivor's benefit is equal to the greater of:

- a. 50% of the monthly benefit that the member would have received if retired at the time of death; or
- b. 30% of the authorized monthly base salary if the member was not eligible to retire, or was entitled to less than 60% of the authorized monthly base salary.

If there is no eligible surviving spouse, the member's dependent children receive, in equal shares, 50% of the benefit under (a) or (b) until age 19, or age 23 and attending an accredited educational or technical institution on a full-time basis.

When there is both an eligible surviving spouse and dependent children residing in separate households, the spouse and children share equally the benefit under (a) or (b) while the children are under age 19, or age 23 and attending an accredited educational or technical institution on a full-time basis.

When there is no surviving spouse or dependent children, the member's contribution account balance, including interest earned, will be paid to the designated beneficiary.

Postemployment Healthcare Benefits

Medical benefits are provided at no cost to JRS members, their spouses, and dependents while monthly retirement, disability, and survivor benefits are being paid.

Participants in the defined benefit plan are covered under the following benefit design:

Plan Feature	Amounts
Deductible (single/family)	\$150 / \$450
Coinsurance (most services)	20%
Outpatient surgery/testing	0%
Maximum Out-of-Pocket (single/family, excluding deductible)	\$800 / \$2,400
Rx Copays (generic/brand/mail-order), does not apply to OOP max	\$4 / \$8 / \$0
Lifetime Maximum	\$2,000,000

The plan coordinates with Medicare on a traditional Coordination of Benefits Method. Starting in 2019, the prescription drug coverage is through a Medicare Part D EGWP arrangement.

Changes in Benefit Provisions Valued Since the Prior Valuation

There were no changes in benefit provisions since the prior valuation.

Section 4.2: Description of Actuarial Methods and Valuation Procedures

The funding method used in this valuation was adopted by the Board in October 2006. Changes in methods were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017. The asset smoothing method used to determine valuation assets was changed effective June 30, 2014.

Benefits valued are those delineated in Alaska State statutes as of the valuation date. Changes in State statutes effective after the valuation date are not taken into consideration in setting the assumptions and methods.

Actuarial Cost Method

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method, level percent of pay.

Each year's difference between actual and expected unfunded actuarial accrued liability is amortized over 25 years as a level percent of expected payroll.

Projected pension and postemployment healthcare benefits were determined for all active members. Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year from the assumed entry age to the last age with a future benefit were applied to the projected benefits to determine the normal cost (the portion of the total cost of the plan allocated to the current year under the method). The normal cost is determined by summing intermediate results for active members and determining an average normal cost rate which is then related to the total payroll of active members. The actuarial accrued liability for active members (the portion of the total cost of the plan allocated to prior years under the method) was determined as the excess of the actuarial present value of projected benefits over the actuarial present value of future normal costs.

The actuarial accrued liability for retired members and their beneficiaries currently receiving benefits, terminated vested members and disabled members not yet receiving benefits was determined as the actuarial present value of the benefits expected to be paid. No future normal costs are payable for these members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of plan assets measured on the valuation date.

Under this method, experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

Valuation of Assets

The actuarial asset value was initialized to equal Fair Value of Assets as of June 30, 2006. Beginning in FY07, the asset valuation method recognizes 20% of the gain or loss each year, for a period of five years. All assets are valued at fair value. Assets are accounted for on an accrued basis and are taken directly from financial statements audited by KPMG LLP. Valuation assets are constrained to a range of 80% to 120% of the fair value of assets.

Changes in Methods Since the Prior Valuation

There were no changes in the asset or valuation methods since the prior valuation.

Valuation of Retiree Medical and Prescription Drug Benefits

This section outlines the detailed methodology used in the internal model developed by Buck to calculate the initial per capita claims cost rates for the JRS postemployment healthcare plan. Note that the methodology reflects the results of our annual experience rate update for the period from July 1, 2019 to June 30, 2020.

Base claims cost rates are incurred healthcare costs expressed as a rate per member per year. Ideally, claims cost rates should be derived for each significant component of cost that can be expected to require differing projection assumptions or methods (i.e., medical claims, prescription drug claims, administrative costs, etc). Separate analysis is limited by the availability and historical credibility of cost and enrollment data for each component of cost. This valuation reflects non-prescription claims separated by Medicare status, including eligibility for free Part A coverage. Prescription costs are analyzed separately as in prior valuations. Administrative costs are assumed in the final per capita claims cost rates used for valuation purposes, as described below. Analysis to date on Medicare Part A coverage is limited since Part A claim data is not available by individual, nor is this status incorporated into historical claim data.

Benefits

Medical, prescription drug, dental, vision and audio coverage is provided through the AlaskaCare Retiree Health Plan and is available to employees of the State and subdivisions who meet retirement criteria based on the retirement plan tier in effect at their date of hire. Health plan provisions do not vary by retirement tier or age, except for Medicare coordination for those Medicare-eligible. Dental, vision and audio claims (DVA) are excluded from data analyzed for this valuation because those are retiree-pay all benefits where rates are assumed to be self-supporting. Buck relies upon rates set by a third-party for the DVA benefits. Buck reviewed historical rate-setting information and views contribution rate adjustments made are not unreasonable.

Administration and Data Sources

The plan was administered by Wells Fargo Insurance Services (acquired by HealthSmart, in January 2012) from July 1, 2009 through December 31, 2013 and by Aetna effective January 1, 2014.

Claims incurred for the period from July 2018 through June 2020 (FY19 through FY20) were provided by the State of Alaska from reports extracted from their data warehouse, which separated claims by Medicare status. Monthly enrollment data for the same period was provided by Aetna.

Aetna also provided census information identifying Medicare Part B only participants. These participants are identified when hospital claims are denied by Medicare; Aetna then flags that participant as a Part B only participant. Buck added newly identified participants to our list of Medicare Part B only participants. Buck assumes that once identified as Part B only, that participant remains in that status until we are notified otherwise.

Aetna provided a snapshot file as of July 1, 2020 of retirees and dependents that included a coverage level indicator. The monthly enrollment data includes double coverage participants. These are participants whereby both the retiree and spouse are retirees from the State and both are reflected with Couple coverage in the enrollment. In this case, such a couple would show up as four members in the monthly enrollment (each would be both a retiree and a spouse). As a result, the snapshot census file was used to adjust the total member counts in the monthly enrollment reports to estimate the number of unique participants enrolled in coverage. Based on the snapshot files from the last two valuations, the total member count in the monthly enrollment reports needs to be reduced by approximately 13% to account for the number of participants with double coverage.

Aetna does not provide separate experience by Medicare status in standard reporting so the special reports mentioned above from the data warehouse were used this year to obtain that information and incorporate it into the per capita rate development for each year of experience (with corresponding weights applied in the final per capita cost).

Methodology

Buck projected historical claim data to FY21 for retirees using the following summarized steps:

- 1. Develop historical annual incurred claim cost rates an analysis of medical costs was completed based on claims information and enrollment data provided by the State of Alaska and Aetna for each year in the experience period of FY19 through FY20.
 - Costs for medical services and prescriptions were analyzed separately, and separate trend rates
 were developed to project expected future medical and prescription costs for the valuation year
 (e.g. from the experience period up through FY21).
 - Because the reports provided reflected incurred claims, no additional adjustment was needed to determine incurred claims to be used in the valuation.
 - An offset for costs expected to be reimbursed by Medicare was incorporated beginning at age 65. Alaska retirees who do not have 40 quarters of Medicare-covered compensation do not qualify for Medicare Part A coverage free of charge. This is a relatively small and closed group. Medicare was applied to State employment for all employees hired after March 31, 1986. For the "no-Part A" individuals who are required to enroll in Medicare Part B, the State is the primary payer for hospital bills and other Part A services. Claim experience is not available separately for participants with both Medicare Parts A and B and those with Part B only. For Medicare Part B only participants, a lower average claims cost was applied to retirees covered by both Medicare Part A and B vs. retirees covered only by Medicare Part B based upon manual rate models that estimate the Medicare covered proportion of medical costs. To the extent that no-Part A claims can be isolated and applied strictly to the appropriate closed group, actuarial accrued liability will be more accurate.
 - Based on census data received from Aetna, less than 1% of the current retiree population was identified as having coverage only under Medicare Part B. We assume that 5% of actives hired before April 1, 1986 and current retirees who are not yet Medicare eligible will not be eligible for Medicare Part A.
 - Based upon a reconciliation of valuation census data to the snapshot eligibility files provided by Aetna as of July 1, 2019, and July 1, 2020, Buck adjusted member counts used for duplicate records where participants have double coverage; i.e. primary coverage as a retiree and secondary coverage as the covered spouse of another retiree. This is to reflect the total cost per distinct individual/member which is then applied to distinct members in the valuation census.
 - Buck understands that pharmacy claims reported do not reflect rebates. Based on actual
 pharmacy rebate information provided by Aetna for years through 2018 and Optum for January
 2019 through June 2020, rebates were assumed to be 17% of prescription drug claims for FY19
 and 19.5% of prescription drug claims for FY20.
- 2. Develop estimated EGWP reimbursements Segal provided estimated 2021 EGWP subsidies, developed with the assistance of OptumRx. These amounts are applicable only to Medicare-eligible participants.
- 3. Adjust for claim fluctuation, anomalous experience, etc. explicit adjustments are often made for anticipated large claims or other anomalous experience. FY19 and FY20 experience were compared to assess the impact of COVID-19 and whether an adjustment to FY20 claims was indicated for use in the June 30, 2020 valuation. A material decrease in medical claims during March 2020 to June 2020 was experienced due to COVID-19. Therefore, an adjustment was made for those months to adjust for the decrease that is not expected to continue in future years. There was an observed spike in prescription drug claims in March 2020; however, the FY20 prescription drug experience appears reasonable to use without adjustment for COVID-19. To adjust for the decrease in medical claims due to COVID-19 during the last 4 months of FY20, the per capita cost during the first 8 months was used as the basis for estimating claims that would have occurred in the absence of COVID-19. Due to group size and demographics, we did not make any additional large claim adjustments. We do blend

both Alaska plan-specific and national trend factors as described below. Buck compared data utilized to lag reports and quarterly plan experience presentations provided by the State and Aetna to assess accuracy and reasonableness of data.

- 4. Trend all data points to the projection period project prior years' experience forward to FY21 for retiree benefits on an incurred claim basis. Trend factors derived from historical Alaska-specific experience and national trend factors are shown in the table in item 5 below.
- 5. Apply credibility to prior experience adjust prior year's data by assigning weight to recent periods, as shown at the right of the table below. The Board approved a change in the weighting of experience periods beginning with the June 30, 2017 valuation as outlined below. Note also that we averaged projected plan costs using Alaska-specific trend factors and national trend factors, assigning 75% weight to Alaska-specific trends and 25% to national trends:

Alaska-Specific and National Average Weighted Trend from Experience Period to Valuation Year									
Experience Period	Medical	Prescription	Weighting Factors						
FY19 to FY20	7.3% Pre-Medicare / 4.6% Medicare	1.2%	50%						
FY20 to FY21	6.3% Pre-Medicare / 5.2% Medicare	7.6%	50%						

Trend assumptions used for rate development are assessed annually and as additional/improved reporting becomes available, we will incorporate into rate development as appropriate.

6. Develop separate administration costs – no adjustments were made for internal administrative costs. Third party retiree plan administration fees for FY21 are based upon total fees projected to 2021 by Segal based on actual FY20 fees. The annual per participant per year administrative cost rate for medical and prescription benefits is \$449.

Healthcare Reform

Healthcare Reform legislation passed on March 23, 2010 included several provisions with potential implications for the State of Alaska Retiree Health Plan liability. Buck evaluated the impact due to these provisions.

Because the State plan is retiree-only, and was in effect at the time the legislation was enacted, not all provisions of the health reform legislation apply to the State plan. Unlimited lifetime benefits and dependent coverage to age 26 are two of these provisions. We reviewed the impact of including these provisions, but there was no decision made to adopt them, and no requirement to do so.

Because Transitional Reinsurance fees are only in effect until 2016, we excluded these for valuation purposes.

The Further Consolidated Appropriations Act, 2020 passed in December 2019 repealed several healthcare-related taxes, including the Cadillac Tax. The valuation results included in the report reflect the repeal of this tax. The removal of the Cadillac Tax created an actuarial gain of approximately \$0.2 million.

The Tax Cuts and Jobs Act passed in December 2017 included the elimination of the individual mandate penalty and changed the inflation measure for purposes of determining the limits for the High Cost Excise Tax to use chained CPI. It is our understanding the law does not directly impact other provisions of the ACA. While the nullification of the ACA's individual mandate penalty does not directly impact employer group health plans, it could contribute to the destabilization of the individual market and increase the number of uninsured. Such destabilization could translate to increased costs for employers. We have considered this when setting our healthcare cost trend assumptions and will continue to monitor this issue.

We have not identified any other specific provisions of healthcare reform or its potential repeal that would be expected to have a significant impact on the measured obligation. We will continue to monitor legislative activity.

Data

In accordance with actuarial standards, we note the following specific data sources and steps taken to value retiree medical benefits:

The Division of Retirement and Benefits provided pension valuation census data, which for people currently in receipt of healthcare benefits was supplemented by coverage data from the healthcare claims administrator (Aetna).

Certain adjustments and assumptions were made to prepare the data for valuation:

- Some records provided on the Aetna data were associated with a participant social security number not listed on the RIN-to-SSN translation file. We reconciled those participants with the pension valuation data as either a surviving spouse or a retiree in the appropriate plan based on account structure information in the Aetna data.
- All records provided with retiree medical coverage on the Aetna data were included in this valuation and we relied on the Aetna data as the source of medical coverage for current retirees and their dependents.
- Some records in the Aetna data were duplicates due to the double coverage (i.e. coverage as a
 retiree and as a spouse of another retiree) allowed under the plan. Records were adjusted for these
 members so that each member was only valued once. Any additional value of the double coverage
 (due to coordination of benefits) is small and reflected in the per capita costs.
- Covered children included in the Aetna data were valued until age 23, unless disabled. We assumed that those dependents over 23 were only eligible and valued due to being disabled.
- For individuals included in the pension data expecting a future pension, we valued health benefits starting at the same point that the pension benefit is assumed to start.

We are not aware of any other data issues that would be expected to have a material impact on the results and there are no unresolved matters related to the data.

The chart below shows the basis of setting the per capita claims cost assumption, which includes PERS, TRS, and JRS.

	Medical			Prescription Drugs (Rx)				
	Pre	-Medicare		Medicare	Р	re-Medicare		Medicare
A. Fiscal 2019								
1. Incurred Claims	\$ 2	30,731,518	\$	80,855,220	\$	63,846,605	\$	183,281,273
2. Adjustments for Rx Rebates		<u>0</u>		<u>0</u>		(10.853.923)		(31,157,816)
3. Net incurred claims	\$ 2	30,731,518	\$	80,855,220	\$	52,992,682	\$	152,123,456
4. Average Enrollment		20,625		42,843		20,625		42,843
5. Claim Cost Rate (3) / (4)		11,187		1,887		2,569		3,551
6. Trend to Fiscal 2021		1.141		1.101		1.089		1.089
7. Fiscal 2021 Incurred Cost Rate (5) x (6)	\$	12,762	\$	2,077	\$	2,798	\$	3,867
B. Fiscal 2020								
1. Incurred Claims	\$ 2	29,531,664	\$	89,497,345	\$	64,442,660	\$	188,022,328
2. Adjustments for Rx Rebates	•	<u>0</u>	•	<u>0</u>	•	(12,566,319)	•	(36,664,354)
3. Net incurred claims	\$ 2	29,531,664	\$	89,497,345	\$	51,876,341	\$	151,357,974
Average Enrollment	•	19,354	•	44,965	•	19,354	•	44,965
5. Claim Cost Rate (3) / (4)		11,860		1,990		2,680		3,366
6. Trend to Fiscal 2021		1.063		1.052		1.076		1.076
7. Fiscal 2021 Incurred Cost Rate (5) x (6)	\$	12,609	\$	2,094	\$		\$	3,623
	Mos		lica	lical		Prescription	Druge (Pv)	
	Pre	-Medicare	1104	Medicare		Pre-Medicare		Medicare
					-			
C. Incurred Cost Rate by Fiscal Year								
1. Fiscal 2019 A.(7)		12,762		2,077		2,798		3,867
2. Fiscal 2020 B.(7)		12,609		2,094		2,885		3,623
D. Weighting by Fiscal Year								
1. Fiscal 2019		50%		50%		50%		50%
2. Fiscal 2020		50%		50%		50%		50%
2. 1 150di 2020		0070		0070		0070		0070
E. Fiscal 2021 Incurred Cost Rate								
1. Rate at Average Age C x D	\$	12,685	\$	2,086	\$	2,842	\$	3,745
Average Aging Factor		0.826		1.263		0.838		1.121
3. Rate at Age 65 (1) / (2)	\$	15,360	\$	1,651	\$	3,393	\$	3,340
E Development of Devt ASD and Devt D								
F. Development of Part A&B and Part B Only Cost from Pooled Rate Above								
•				44 560				
Part B Only Average Enrollment Part B Only Average Enrollment				44,568				
2. Part B Only Average Enrollment				398				
3. Total Medicare Average Enrollment B(4)				44,965				
Cost ratio for those with Part B only to those with Parts A&B				3.300				
5. Factor to determine cost for those with				0.000				
Parts A&B				1.020				
(2) / (3) x (4) + (1) / (3) x 1.00								
6. Medicare per capita cost for all				V				
participants: E(3)			\$	1,651				
7. Cost for those eligible for Parts A&B: (6)	(5)		\$	1,618				
8. Cost for those eligible for Part B only: (7)			\$	5,340				
					•			

Following the development of total projected costs, a distribution of per capita claims cost was developed. This was accomplished by allocating total projected costs to the population census used in the valuation. The allocation was done separately for each of prescription drugs and medical costs for the Medicare eligible and pre-Medicare populations. The allocation weights were developed using participant counts by age and assumed morbidity and aging factors. Results were tested for reasonableness based on historical trend and external benchmarks for costs paid by Medicare.

Below are the results of this analysis:

Distribution of Per Capita Claims Cost by Age for the Period July 1, 2020 through June 30, 2021

Age	Medical and Medicare Parts A & B	Medical and Medicare Part B Only	Prescription Drug	Medicare EGWP Subsidy	
45	\$ 9,374	\$ 9,374	\$ 2,072	\$ 0	
50	10,605	10,605	2,461	0	
55	11,999	11,999	2,923	0	
60	13,576	13,576	3,149	0	
65	1,618	5,340	3,340	1,003	
70	1,876	6,191	3,688	1,107	
75	2,174	7,177	4,071	1,223	
80	2,401	7,923	3,971	1,192	

Section 4.3: Summary of Actuarial Assumptions

The demographic and economic assumptions used in the June 30, 2020 valuation are described below. Unless noted otherwise, these assumptions were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017.

Investment Return

7.38% per year, net of investment expenses.

Salary Scale

0% per year for FY21 through FY24, and 3.62% per year thereafter.

Payroll Growth

2.75% per year (inflation + productivity).

Total Inflation

Total inflation as measured by the Consumer Price Index for urban and clerical workers for Anchorage is assumed to increase 2.50% annually.

Compensation and Benefit Limit Increases

Compensation is limited to the IRC 401(a)(17) amount, which was \$285,000 for 2020. This limit is assumed to increase 2.50% each year thereafter.

Benefits are limited to the IRC 415 amount, which was \$230,000 for 2020. This limit is assumed to increase 2.50% each year thereafter.

Benefit Payment Increases

Benefits for retired members are assumed to increase 0% per year for FY21 through FY24, and 3.62% per year thereafter.

Mortality (Pre-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

RP-2014 white-collar employee table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Mortality (Post-Commencement)

Mortality rates based upon the 2013-2017 actual experience.

93% of male and 90% of female rates of RP-2014 white-collar healthy annuitant table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Turnover

Select rate of 3% for service less than 10 years, with an ultimate rate of 1% thereafter. Turnover rates cease once a member is eligible for retirement.

Disability

Incidence rates as shown in Table 1.

Post-disability mortality in accordance with the RP-2014 disabled table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Retirement

Retirement rates as shown in Table 2.

Deferred vested members are assumed to retire at age 60.

Form of Payment

Married members are assumed to elect the 50% Joint and Survivor benefit option. Single members are assumed to elect the Modified Cash Refund Annuity.

Spouse Age Difference

Males are assumed to be four years older than their wives. Females are assumed to be four years younger than husbands.

Percent Married for Pension

90% of male members and 70% of female members are assumed to be married at termination from active service.

Dependent Spouse Medical Coverage Election

Applies to members who do not have double medical coverage. 90% of male members and 70% of female members are assumed to be married and cover a dependent spouse.

Dependent Children

- Pension: None.
- Healthcare: Benefits for dependent children have been valued only for members currently covering their dependent children. These benefits are only valued through the dependent children's age 23 (unless the child is disabled).

Contribution Refunds

0% of terminating members with vested benefits are assumed to have their contributions refunded. 100% of those with non-vested benefits are assumed to have their contributions refunded.

Imputed Data

Data changes from the prior year which are deemed to have an immaterial impact on liabilities and contribution rates are assumed to be correct in the current year's client data. Non-vested terminations with appropriate refund dates are assumed to have received a full refund of contributions. Active members with missing salary and service are assumed to be terminated with status based on their vesting percentage.

Expenses

The investment return assumption is net of investment expenses. The Normal Cost as of June 30, 2020 was increased by the following amounts for administrative expenses:

Pension: \$83,000Healthcare: \$24,000

Per Capita Claims Cost

Sample claims cost rates adjusted to age 65 for FY21 medical and prescription drugs are shown below:

	Medical		Prescript	tion Drugs
Pre-Medicare	\$	15,360	\$	3,393
Medicare Parts A & B	\$	1,618	\$	3,340
Medicare Part B Only	\$	5,340	\$	3,340
Medicare Part D – EGWP		N/A	\$	1,003

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2021 fiscal year (July 1, 2020 – June 30, 2021).

The EGWP subsidy is assumed to increase in future years by the trend rates shown on the following pages. No future legislative changes or other events are anticipated to impact the EGWP subsidy. If any legislative or other changes occur in the future that impact the EGWP subsidy (which could either increase or decrease the plan's Actuarial Accrued Liability), those changes will be evaluated and quantified when they occur.

Third Party Administrator Fees

\$449 per person per year; assumed to increase at 4.5% per year.

Medicare Part B Only

We assume that 5% of actives hired before April 1, 1986 and current retirees who are not yet Medicare eligible will not be eligible for Medicare Part A.

Healthcare Cost Trend

The table below shows the rate used to project the cost from the shown fiscal year to the next fiscal year. For example, 6.5% is applied to the FY21 pre-Medicare medical claims costs to get the FY22 medical claims costs.

	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY21	6.5%	5.4%	7.5%
FY22	6.3%	5.4%	7.1%
FY23	6.1%	5.4%	6.8%
FY24	5.9%	5.4%	6.4%
FY25	5.8%	5.4%	6.1%
FY26	5.6%	5.4%	5.7%
FY27-FY40	5.4%	5.4%	5.4%
FY41	5.3%	5.3%	5.3%
FY42	5.2%	5.2%	5.2%
FY43	5.1%	5.1%	5.1%
FY44	5.1%	5.1%	5.1%
FY45	5.0%	5.0%	5.0%
FY46	4.9%	4.9%	4.9%
FY47	4.8%	4.8%	4.8%
FY48	4.7%	4.7%	4.7%
FY49	4.6%	4.6%	4.6%
FY50+	4.5%	4.5%	4.5%

For the June 30, 2014 valuation and later, the updated Society of Actuaries' Healthcare Cost Trend Model is used to project medical and prescription drug costs. This model estimates trend amounts that are projected out for 80 years. The model has been populated with assumptions that are specific to the State of Alaska.

Aging Factors

Age	Medical	Prescription Drugs
0 – 44	2.0%	4.5%
45 – 54	2.5%	3.5%
55 – 64	2.5%	1.5%
65 – 74	3.0%	2.0%
75 – 84	2.0%	-0.5%
85 – 94	0.3%	-2.5%
95+	0.0%	0.0%

Healthcare Participation

100% of system paid members and their spouses are assumed to elect healthcare benefits as soon as they are eligible.

Changes in Assumptions Since the Prior Valuation

Healthcare claim costs are updated annually as described in Section 4.2. The Further Consolidated Appropriations Act, 2020 that was signed in December 2019 made several changes, including the repeal of the Cadillac Tax. The repeal of the Cadillac Tax reduced the plan's liabilities as of June 30, 2020 by approximately \$0.2 million. The salary and pensioner benefit increase assumptions were modified to be 0% per year for FY21 through FY24, and 3.62% per year thereafter. The amounts included in the Normal Cost for administrative expenses were changed from \$71,050 to \$83,000 for pension and from \$19,250 to \$24,000 for healthcare (based on the most recent two years of actual administrative expenses paid from plan assets).

Table 1: Disability Rates

Ago	Poto	Ago	Poto
Age	Rate	Age	Rate
20	0.017%	40	0.029%
21	0.017	41	0.030
22	0.018	42	0.032
23	0.018	43	0.034
24	0.018	44	0.037
25	0.019	45	0.041
26	0.019	46	0.044
27	0.019	47	0.048
28	0.020	48	0.052
29	0.020	49	0.056
30	0.021	50	0.060
31	0.021	51	0.065
32	0.022	52	0.072
33	0.022	53	0.080
34	0.023	54	0.089
35	0.024	55	0.100
36	0.025	56	0.115
37	0.026	57	0.134
38	0.027	58	0.153
39	0.028	59	0.180
		60+	0.000

Table 2: Retirement Rates

Age	Rate
< 59	3%
59	10
60	20
61	20
62	10
63	10
64	10
65	20
66	20
67	10
68	10
69	10
70+	100

Section 5: Actuarial Standard of Practice No. 51

Funding future retirement benefits prior to when those benefits become due involves assumptions regarding future economic and demographic experience. These assumptions are applied to calculate actuarial liabilities, current contribution requirements, and the funded status of the plan. However, to the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the plan. Understanding the risks to the funding of the plan is important.

Actuarial Standard of Practice No. 51 (ASOP 51)¹ requires certain disclosures of potential risks to the plan and provides useful information for intended users of actuarial reports that determine plan contributions or evaluate the adequacy of specified contribution levels to support benefit provisions.

Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

It is important to note that not all risk is negative, but all risk should be understood and accepted based on knowledge, judgement, and educated decisions. Future measurements may deviate in ways that produce positive or negative financial impacts to the plan.

In the actuary's professional judgment, the following risks may reasonably be anticipated to significantly affect the pension plan's future financial condition and contribution requirements.

- Investment Risk potential that the investment return will be different than the 7.38% expected in the
 actuarial valuation
- Contribution Risk potential that the contribution actually made will be different than the actuarially determined contribution
- Long-Term Return on Investment Risk potential that changes in long-term capital market assumptions or the plan's asset allocation will create the need to update the long-term return on investment assumption
- Longevity Risk potential that participants live longer than expected compared to the valuation mortality assumptions
- Salary Increase Risk potential that future salaries will be different than expected in the actuarial valuation
- Inflation Risk potential that the consumer price index (CPI) for urban wage earners and clerical workers for Anchorage is different than the 2.5% assumed in the valuation
- Other Demographic Risk potential that other demographic experience will be different than expected

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the plan. **This list is not all-inclusive**; it is an attempt to identify the more significant risks and how those risks might affect the results shown in this report.

Note that ASOP 51 does not require the actuary to evaluate the ability or willingness of the plan sponsor to make contributions to the plan when due, or to assess the likelihood or consequences of potential future changes in law. In addition, this valuation report is not intended to provide investment advice or to provide guidance on the management or reduction of risk.

ASOP 51 does not apply to the healthcare portion of the plan. Accordingly, all figures in this section relate to the pension portion.

Assessment of Risks

Investment Risk

Plan costs are very sensitive to the market return.

- Any return on assets lower than assumed will increase costs.
- The plan uses an actuarial value of assets that smooths gains and losses on market returns over a five-year period to help control some of the volatility in costs due to investment risk.
- Historical experience of actual returns is shown in Section 2.5 of this report. This historical experience illustrates how returns can vary over time.

Contribution Risk

There is a risk to the plan when the employer's and/or State's actual contribution amount and the actuarially determined contribution differ.

- If the actual contribution is lower than the actuarially determined contribution, the plan may not be sustainable in the long term.
- Any underpayment of the contribution will increase future contribution amounts to help pay off the additional Unfunded Actuarial Accrued Liability associated with the underpayment(s).
- As long as the Board consistently adopts the actuarially determined contributions, this risk is mitigated
 due to Alaska statutes requiring the State to contribute additional funds necessary to pay the total
 contributions adopted by the Board.

Long-Term Return on Investment Risk

Inherent in the long-term return on investment assumption is the expectation that the current rate will be used until the last benefit payment of the plan is made. There is a risk that sustained changes in economic conditions, changes in long-term future capital market assumptions, or changes to the plan's asset allocation will necessitate an update to the long-term return on investment assumption used.

- Under a lower long-term return on investment assumption, less investment return is available to pay plan benefits. This may lead to a need for increased employer contributions.
- The liabilities will be higher at a lower assumed rate of return because future benefits will have a lower discount rate applied when calculating the present value.
- A 1% decrease in the long-term return on investment assumption will increase actuarial accrued liability by approximately 11%.

Longevity Risk

Plan costs will be increased as participants are expected to live longer.

- Benefits are paid over a longer lifetime when life expectancy is expected to increase. The longer duration of payments leads to higher liabilities.
- Health care has been improving, which affects the life expectancy of participants. As health care improves, leading to longer life expectancies, costs to the plan could increase.
- The mortality assumption for the plan mitigates this risk by assuming future improvement in mortality. However, any improvement in future mortality greater than that expected by the current mortality assumption would lead to increased costs for the plan.
- The plan provides cost-of-living adjustments on retirement benefits (based on salary changes of sitting judges) that increase longevity risk, because members who live longer than expected will incur more benefit payment increases than expected and therefore increase costs.

Salary Increase Risk

Plan costs will be increased if actual salary increases are larger than expected.

- · Higher-than-expected salary increases will produce higher benefits.
- The higher benefits may be partially offset by increased employee contributions due to higher salaries.
- If future payroll grows at a rate different than assumed, contributions as a percentage of payroll will be affected.

Inflation Risk

Inflation risk may be associated with the interaction of inflation with other assumptions, but this is not significant as a standalone assumption, and therefore is considered as part of the associated assumption risk instead of being discussed here.

Other Demographic Risk

The plan is subject to risks associated with other demographic assumptions (e.g., retirement and termination rates). Differences between actual and expected experience for these assumptions tend to have less impact on the overall costs of the plan. The demographic assumptions used in the valuation are re-evaluated regularly as part of the four-year experience studies to ensure the assumptions are consistent with long-term expectations.

Historical Information

Monitoring certain information over time may help understand risks faced by the plan. Historical information is included throughout this report. Some examples are:

- Section 1.5 shows how the plan's funded status (comparison of actuarial accrued liabilities to actuarial value of assets) has changed over time.
- Section 2.5 shows the volatility of asset returns over time.
- Section 3 includes various historical information showing how member census data has changed over time.

Plan Maturity Measures

There are certain measures that may aid in understanding the significant risks to the plan.

Ratio of Retired Liability to Total Liability		lune 30, 2018	June 30, 2020		
Retiree and Beneficiary Accrued Liab	sility \$	156,622,684	\$ 164,454,193		
2. Total Accrued Liability	\$	226,559,580	\$ 211,742,043		
3. Ratio, (1) ÷ (2)		69.1%	77.7%		

A high percentage of liability concentrated on participants in pay status indicates a mature plan (often a ratio above 60% - 65%). An increasing percentage may indicate a need for a less risky asset allocation, which may lead to a lower long-term return on asset assumption and increased costs. Higher percentages may also indicate greater investment risk as benefit payments may be greater than contributions creating an increased reliance on investment returns. This ratio should be monitored each year in the future.

Ra	tio of Cash Flow to Assets	FYI	E June 30, 2018	FYE	June 30, 2020
1.	Contributions	\$	11,360,677	\$	11,965,820
2.	Benefit Payments	_	12,125,563	_	14,178,500
3.	Cash Flow, (1) - (2)	\$	(764,886)	\$	(2,212,680)
4.	Fair Value of Assets	\$	176,794,969	\$	189,844,025
5.	Ratio, (3) ÷ (4)		(0.4%)		(1.2%)

When this cash flow ratio is negative, more cash is being paid out than deposited in the trust. Negative cash flow indicates the trust needs to rely on investment returns to cover benefit payments and / or may need to invest in more liquid assets to cover the benefit payments. More liquid assets may not generate the same returns as less liquid assets, which can increase the investment risk. Currently, the low magnitude of the ratio implies there may already be enough liquid assets to cover the benefit payments, less investment return is needed to cover the shortfall, or only a small portion of assets will need to be converted to cash. Therefore, the investment risk is likely not amplified at this time. This maturity measure should be monitored in the future.

Contribution Volatility		J	June 30, 2018		June 30, 2020	
1.	Fair Value of Assets	\$	176,794,969	\$	189,844,025	
2.	Payroll	\$	13,392,864	\$	13,157,172	
3.	Asset to Payroll Ratio, (1) ÷ (2)		1,320.1%		1,442.9%	
4.	Accrued Liability	\$	226,559,580	\$	211,742,043	
5.	Liability to Payroll Ratio, (4) ÷ (2)		1,691.6%		1,609.3%	

Plans that have higher asset-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to investment return. For example, a plan with an asset-to-payroll ratio of 10% may experience twice the contribution volatility due to investment return volatility than a plan with an asset-to-payroll ratio of 5%. Plans that have higher liability-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to changes in liability. For example, if an assumption change increases the liability of two plans by the same percent, the plan with a liability-to-payroll ratio of 10% may experience twice the contribution volatility than a plan with a liability-to-payroll ratio of 5%.

Glossary of Terms

Actuarial Accrued Liability

Total accumulated cost to fund pension or postemployment benefits arising from service in all prior years.

Actuarial Cost Method

Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension or postemployment plan for a group of plan members to the years of service that give rise to that cost.

Actuarial Present Value of Projected Benefits

Amount which, together with future interest, is expected to be sufficient to pay all future benefits.

Actuarial Valuation

Study of probable amounts of future pension or postemployment benefits and the necessary amount of contributions to fund those benefits.

Actuary

Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.

GASB 67 and 68

Governmental Accounting Standards Board Statement Number 67 amends Number 25 effective for the fiscal year beginning after June 15, 2013 and defines new financial reporting requirements for public pension plans.

Governmental Accounting Standards Board Statement Number 68 amends Number 27 effective for fiscal years beginning after June 15, 2014 and defines new accounting and financial reporting requirements for employers sponsoring public pension plans.

GASB 74 and 75

Governmental Accounting Standards Board Statement Number 74 amends Number 43 effective for the fiscal year beginning after June 15, 2016 and defines new financial reporting requirements for public postemployment benefit plans.

Governmental Accounting Standards Board Statement Number 75 amends Number 45 effective for fiscal years beginning after June 15, 2017 and defines new accounting and financial reporting requirements for employers sponsoring public postemployment benefit plans.

Normal Cost

That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.

Unfunded Actuarial Accrued Liability (UAAL)

The portion of the actuarial accrued liability not offset by plan assets.

Vested Benefits

Benefits which are unconditionally guaranteed regardless of employment.



State of Alaska

National Guard and Naval Militia Retirement System

Actuarial Valuation Report As of June 30, 2020

May 2021



May 20, 2021

State of Alaska
The Alaska Retirement Management Board
The Department of Revenue, Treasury Division
The Department of Administration, Division of Retirement and Benefits
P.O. Box 110203
Juneau, AK 99811-0203

Certification of Actuarial Valuation

Dear Members of The Alaska Retirement Management Board, The Department of Revenue and The Department of Administration:

This report summarizes the actuarial valuation results of the State of Alaska National Guard and Naval Militia Retirement System (NGNMRS) as of June 30, 2020 performed by Buck Global, LLC (Buck). This report is an update to the draft report dated February 26, 2021, reflecting minor wording changes.

The actuarial valuation is based on financial information provided in the financial statements audited by KPMG LLP, and member data provided by the Division of Retirement and Benefits as summarized in this report. The benefits considered are those delineated in Alaska statutes effective June 30, 2020. The actuary did not verify the data submitted, but did perform tests for consistency and reasonableness.

All costs, liabilities and other factors under NGNMRS were determined in accordance with generally accepted actuarial principles and procedures. An actuarial cost method is used to measure the actuarial liabilities which we believe is reasonable. Buck is solely responsible for the actuarial data and actuarial results presented in this report. This report fully and fairly discloses the actuarial position of NGNMRS as of June 30, 2020.

The contribution requirements reflect the cost of benefits accruing in the upcoming year, administrative expenses expected to be paid from the trust, and a level dollar amortization of the initial unfunded actuarial accrued liability and subsequent gains/losses over a period of 20 years less average military service of active members. The contribution levels are recommended by the actuary and adopted by the Board each year. This objective is currently being met and is projected to continue to be met. Absent future gains/losses, actuarially determined contributions are expected to remain zero and the funded status is expected to remain at or above 100%.

The Board and staff of the State of Alaska may use this report for the review of the operations of NGNMRS. Use of this report for any other purpose or by anyone other than the Board or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, you should ask Buck to review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without the review by Buck.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for

these measurements, and changes in plan provisions or applicable law. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In my opinion, the actuarial assumptions used are reasonable, taking into account the experience of the plan and reasonable long-term expectations, and represent my best estimate of the anticipated long-term experience under the plan. The actuary performs an analysis of plan experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience. The last full experience analysis was performed for the period July 1, 2013 to June 30, 2017. Based on that experience study, the Board adopted new assumptions effective beginning with the June 30, 2018 valuation to better reflect expected future experience. A summary of the actuarial assumptions and methods used in this actuarial valuation is shown in Sections 4.2 and 4.3. We certify that the assumptions and methods described in Sections 4.2 and 4.3 of this report meet the requirements of all applicable Actuarial Standards of Practice.

Governmental Accounting Standards Board (GASB) Statement No. 67 (GASB 67) was effective for NGNMRS beginning with fiscal year ending June 30, 2014. A separate GASB 67 report as of June 30, 2020 has been prepared. We have also prepared the member data tables shown in Section 3 of this report for the Statistical Section of the CAFR, as well as the summary of actuarial assumptions and analysis of financial experience for the Actuarial Section of the CAFR. Please see our separate GASB 67 report for other information needed for the CAFR.

Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) applies to actuaries performing funding calculations related to a pension plan. See Section 5 of this report for further details regarding ASOP 51.

Use of Models

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to internally developed models that apply applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal models are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal models, extra checking and review are completed. Significant changes to the internal models that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

This report was prepared under my supervision and in accordance with all applicable Actuarial Standards of Practice. I am a Fellow of the Society of Actuaries, an Enrolled Actuary, a Fellow of the Conference of Consulting Actuaries and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

I am available to discuss this report with you at your convenience. I can be reached at (602) 803-6174.

Respectfully submitted,

II KL

David J. Kershner, FSA, EA, MAAA, FCA

Principal Buck

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Executive Summary

Overview

The State of Alaska National Guard and Naval Militia Retirement System (NGNMRS) provides pension benefits to the National Guard, naval militia and other eligible members. The Commissioner of the Department of Administration is responsible for administering the plan. The Alaska Retirement Management Board has fiduciary responsibility over the assets of the plan. This report presents the results of the actuarial valuation of NGNMRS as of the valuation date of June 30, 2020.

Purpose

An actuarial valuation is performed on the plan once every two years as of the end of the fiscal year, and roll-forward valuations are performed every other year. The main purposes of the actuarial valuation detailed in this report are:

- 1. To determine the Employer contribution necessary to meet the Board's funding policy for the plan;
- 2. To disclose the funding assets and liability measures as of the valuation date;
- 3. To review the current funded status of the plan and assess the funded status as an appropriate measure for determining future actuarially determined contributions;
- 4. To compare actual and expected experience under the plan during the fiscal year; and
- 5. To report trends in contributions, assets, liabilities, and funded status over the last several years.

The actuarial valuation provides a "snapshot" of the funded position of NGNMRS based on the plan provisions, membership data, assets, and actuarial methods and assumptions as of the valuation date.

1

Funded Status

Where presented, references to "funded ratio" and "unfunded actuarial accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded actuarial accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

Funded Status as of June 30	2018	2020
a. Actuarial Accrued Liability	\$ 21,934,014	\$ 22,417,247
b. Valuation Assets	41,031,353	43,020,393
c. Unfunded Actuarial Accrued Liability, (a) – (b)	\$ (19,097,339)	\$ (20,603,146)
d. Funded Ratio based on Valuation Assets, (b) \div (a)	187.1%	191.9%
e. Fair Value of Assets	\$ 39,418,117	\$ 42,095,708
f. Funding Ratio based on Fair Value of Assets, (e) \div (a)	179.7%	187.8%
Actuarially Determined Contribution Amounts	FY21	FY23
a. Normal Cost	\$ 483,551	\$ 503,140
b. Past Service Cost	(2,988,961)	(3,224,638)
c. Expense Load	242,000	256,000
d. Total Annual Contribution, (a) + (b) + (c), not less than 0	\$ 0	\$ 0

The Actuarially Determined Contribution amount for FY22 based on a roll-forward valuation as of June 30, 2019 was \$0.

The key reasons for the change in funded status are described below:

1. Investment Experience

The approximate investment returns based on fair value of assets were 5.9% for FY19 and 5.3% for FY20, compared to the expected investment return of 7.00% (net of investment expenses). This resulted in market asset losses of approximately \$0.4 million for FY19 and \$0.7 million for FY20. Due to the recognition of investment gains and losses over a 5-year period, the investment returns based on actuarial value of assets were approximately 4.1% for FY19 and 5.1% for FY20.

2. Demographic Experience

Section 3 provides statistics on active and inactive participants. The number of active participants increased from 3,777 at June 30, 2018 to 3,934 at June 30, 2020. The average age of active participants increased from 33.92 to 34.20, and average credited service increased from 6.69 years to 6.87 years.

The number of retirees and QDROs decreased from 752 to 708, and their average age decreased from 59.18 to 58.83.

The number of vested terminated participants increased from 588 to 649, and their average age increased from 56.10 to 57.00.

The overall effect of the demographic experience was a liability gain of approximately \$49,000 (approximately 0.2% of the expected liability).

3. Changes in Methods Since the Prior Valuation

There were no changes in actuarial methods since the prior valuation.

4. Changes in Assumptions Since the Prior Valuation

The amount included in the Normal Cost for administrative expenses was changed from \$242,000 at June 30, 2018 to \$256,000 at June 30, 2020.

5. Changes in Benefit Provisions Since the Prior Valuation

There were no changes in benefit provisions since the prior valuation.

Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost

As of June 30, 2020		Present Value of Projected Benefits		uarial Accrued Liability
Active Members				
Retirement Benefits	\$	12,348,831	\$	9,756,772
Termination Benefits		0		0
Death Benefits		270,264		194,224
Disability Benefits		120,136		95,473
Subtotal	\$	12,739,231	\$	10,046,469
Inactive Members				
Vested Terminated	\$	6,562,774	\$	6,562,774
Retirees (including QDROs)		5,808,004		5,808,004
Subtotal	\$	12,370,778	\$	12,370,778
Total	\$	25,110,009	\$	22,417,247

As of June 30, 2020	Normal Cost		
Active Members			
Retirement Benefits	\$	484,418	
Termination Benefits		0	
Death Benefits		14,108	
Disability Benefits		4,614	
Subtotal	\$	503,140	
Expense Load			
Administrative Expense	\$	256,000	
Total	\$	759,140	

Section 1.2: Actuarial Contributions as of June 30, 2020 (for FY23)

1.	Actuarial Accrued Liability	\$ 22,417,247
2.	Valuation Assets	 43,020,393
3.	Total Unfunded Actuarial Accrued Liability, (1) – (2)	\$ (20,603,146)
4.	Past Service Cost Amortization Payment ¹	(3,224,638)
5.	Normal Cost, including Expense Load	 759,14 <u>0</u>
6.	Total Contribution, (4) + (5), not less than 0	\$ 0

¹ Calculated on a level dollar basis over an 8-year period as of June 30, 2020.

Section 1.3: Actuarial Gain/(Loss) for FY20

1.	Evi	pected Actuarial Accrued Liability		
١.	∟∧ a.	Actuarial Accrued Liability Actuarial Accrued Liability, June 30, 2019	\$	22 502 992
	a. b.	Normal Cost for FY20	Ф	22,592,882
				483,551
	C.	Interest on (a) and (b) at 7.00%		1,615,350
	d.	Benefit Payments for FY20		(1,641,475)
	e.	Interest on (d) at 7.00%, adjusted for timing		(61,273)
	f.	Change in Actuarial Assumptions		0
	g.	Expected Actuarial Accrued Liability as of June 30, 2020, (a) + (b) + (c) + (d) + (e) + (f)	\$	22,989,035
2.	Act	tual Actuarial Accrued Liability, June 30, 2020		22,417,247
3.	Lia	bility Gain/(Loss), (1)(g) – (2)	\$	571,788 ¹
4.	Ex	pected Actuarial Asset Value		
	a.	Actuarial Asset Value, June 30, 2019	\$	41,939,204
	b.	Interest on (a) at 7.00%		2,935,744
	C.	Employer Contributions for FY20		860,686
	d.	Interest on (c) at 7.00%, adjusted for timing		29,615
	e.	Benefit Payments for FY20		(1,641,475)
	f.	Interest on (e) at 7.00%, adjusted for timing		(61,273)
	g.	Administrative Expenses for FY20		(230,609)
	h.	Interest on (g) at 7.00%, adjusted for timing		(7,935)
	i.	Expected Actuarial Asset Value as of June 30, 2020,	\$	43,823,957
		(a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)		
5.	Act	tuarial Asset Value, June 30, 2020		43,020,393
6.	Ac	tuarial Asset Gain/(Loss), (5) – (4)(i)	\$	(803,564)
7.	Ac	tuarial Gain/(Loss), (3) + (6)	\$	(231,776) ²

Includes a liability reduction of \$522,826 due to programming enhancements for determining lump sum actuarial equivalence. The FY20 liability experience gain excluding the \$522,826 programming effect is \$48,962.
 The FY20 actuarial loss excluding the \$522,826 programming effect is \$754,602.

Section 1.4: Development of Change in Unfunded Liability during FY20

1.	June 30, 2019 Unfunded Liability	\$ (19,346,322)
	a. Normal Cost	483,551
	b. Interest on (1) and (1)(a)	(1,320,394)
	c. Employer Contributions	(860,686)
	d. Interest on (c)	(29,615)
	e. Administrative Expenses	230,609
	f. Interest on (e)	7,935
	g. Change in Actuarial Assumptions	 0
	h. Expected Change in Unfunded Liability during FY20	\$ (1,488,600)
2.	Expected June 30, 2020 Unfunded Liability, (1) + (1)(h)	\$ (20,834,922)
	a. Liability gain/(loss)	571,788 ¹
	b. Asset gain/(loss)	 (803,564)
	c. Actuarial gain/(loss) during FY20, (2)(a) + (2)(b)	\$ $(231,776)^2$
3.	Actual June 30, 2020 Unfunded Liability, (2) - (2)(c)	\$ (20,603,146)

 ^{\$48,962} liability gain excluding the \$522,826 programming effect.
 \$754,602 actuarial loss excluding the \$522,826 programming effect.

Section 1.5: History of Unfunded Liability and Funded Ratio

Valuation Date	Actuarial				Assets as a Percent of Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability (UAAL)	
June 30, 2000	\$	17,967,471	\$ 13,734,397	76.4%	\$	4,233,074	
June 30, 2002	\$	20,545,214	\$ 12,114,025	59.0%	\$	8,431,189	
June 30, 2004	\$	19,749,305	\$ 13,391,055	67.8%	\$	6,358,250	
June 30, 2006	\$	25,457,589	\$ 15,587,569	61.2%	\$	9,870,020	
June 30, 2007	\$	26,289,978	\$ 16,882,529	64.2%	\$	9,407,449	
June 30, 2008	\$	28,904,645	\$ 28,370,756	98.2%	\$	533,889	
June 30, 2009	\$	30,208,411	\$ 30,123,348	99.7%	\$	85,063	
June 30, 2010	\$	30,034,407	\$ 32,000,585	106.5%	\$	(1,966,178)	
June 30, 2011	\$	31,324,457	\$ 33,019,577	105.4%	\$	(1,695,120)	
June 30, 2012	\$	32,771,017	\$ 33,682,091	102.8%	\$	(911,074)	
June 30, 2013	\$	33,907,968	\$ 34,178,622	100.8%	\$	(270,654)	
June 30, 2014	\$	36,715,287	\$ 36,271,836	98.8%	\$	443,451	
June 30, 2015	\$	38,313,473	\$ 37,855,133	98.8%	\$	458,340	
June 30, 2016	\$	31,184,361	\$ 38,439,835	123.3%	\$	(7,255,474)	
June 30, 2017	\$	32,483,912	\$ 39,638,736	122.0%	\$	(7,154,824)	
June 30, 2018 ¹	\$	21,934,014	\$ 41,031,353	187.1%	\$	(19,097,339)	
June 30, 2019	\$	22,592,882	\$ 41,939,204	185.6%	\$	(19,346,322)	
June 30, 2020	\$	22,417,247	\$ 43,020,393	191.9%	\$	(20,603,146)	

Approximately \$10.7 million of the decrease in Actuarial Accrued Liability reflected in the June 30, 2018 valuation was due to the elimination of 798 active and vested terminated participants who had cashed out prior to June 30, 2016.

Section 2: Plan Assets

Section 2.1 Summary of Fair Value of Assets

Fair Value of Assets as of June 30	2019	2020
Assets		
1. Cash and Cash Equivalents	\$ 349,952	\$ 73,584
2. Receivables	2,001	309
3. Domestic Equity Pool	11,113,397	11,986,239
4. International Equity Pool	6,171,370	7,671,073
5. Tactical Fixed Income Pool	188,888	0
6. Domestic Fixed Income Pool	18,110,335	17,711,943
7. Emerging Market Equity Pool	1,214,537	1,604,112
8. Taxable Municipal Bonds	1,143,669	0
9. Tactical Allocation Strategies Pool	676,858	1,999,801
10. Alternative Equity	2,089,894	416,501
11. Alternative Beta	 0	 729,363
12. Total Assets	\$ 41,060,901	\$ 42,192,925
Liabilities		
13. Accrued expenses	\$ 18,765	\$ 22,473
14. Due to State of Alaska General Fund	12,442	12,097
15. Securities Lending Collateral Payable	 64,697	 62,647
16. Total Liabilities	\$ 95,904	\$ 97,217
Fair Value of Assets, (13) – (16)	\$ 40,964,997	\$ 42,095,708

Section 2.2: Changes in Fair Value of Assets

Fair Va	Fair Value of Assets as of June 30 2019 2020								
1. Fair	Value of Assets at beginning of year		39,418,117		40,964,997				
2. Add	itions								
a.	Employer Contributions	\$	851,686	\$	860,686				
b.	Investment Income		2,387,714		2,199,040				
C.	Other		0		0				
d.	Total Additions	\$	3,239,400	\$	3,059,726				
3. Dist	pursements								
a.	Retirement Benefits	\$	1,343,753	\$	1,641,475				
b.	Administrative Expenses		282,338		230,609				
C.	Investment Expenses		66,429		<u>56,931</u>				
d.	Total Deductions	\$	1,692,520	\$	1,929,015				
4. Fair	Value of Assets at end of year, (1) + (2)(d) - (3)(d)	\$	40,964,997	\$	42,095,708				
Approximate Fair Value Investment Return Rate Net of Investment Expenses 5.9% 5.3%									
	,p==	0.070		0.070					

Section 2.3: Development of Actuarial Value of Assets

The actuarial value of assets was equal to the market value at June 30, 2006. Future investment gains and losses will be recognized 20% per year over 5 years. In no event may valuation assets be less than 80% or more than 120% of market value as of the valuation date.

1.	Inv	estment Gain/(Loss) for FY20	
	a.	Market Value, June 30, 2019	\$ 40,964,997
	b.	Contributions for FY20	860,686
	C.	Benefit Payments for FY20	1,641,475
	d.	Administrative Expenses for FY20	230,609
	e.	Actual Investment Return (net of investment expenses)	2,142,109
	f.	Expected Return Rate (net of investment expenses)	7.00%
	g.	Expected Return - Weighted for Timing	2,827,956
	h.	Investment Gain/(Loss) for the Year, (e) – (g)	(685,847)
2.	Act	uarial Value, June 30, 2020	
	a.	Market Value, June 30, 2020	\$ 42,095,708
	b.	Deferred Investment Gain/(Loss)	 (924,685)
	c.	Preliminary Actuarial Value, June 30, 2020, (a) – (b)	\$ 43,020,393
	d.	Upper Limit: 120% of Market Value, June 30, 2020	\$ 50,514,850
	e.	Lower Limit: 80% of Market Value, June 30, 2020	\$ 33,676,566
	f.	Actuarial Value, June 30, 2020, [(c) limited by (d) and (e)]	\$ 43,020,393
	g.	Ratio of Actuarial Value of Assets to Market Value of Assets	102.2%
	h.	Approximate Actuarial Value Investment Return Rate During FY20 (net of investment expenses)	5.1%

The table below shows the development of gains/(losses) to be recognized in the current year:

Fiscal Year Ending	Asset Gain/(Loss)	Gain/(Loss) Recognized in Prior Years	Gain/(Loss) Recognized This Year	Gain/(Loss) Deferred to Future Years	
June 30, 2016	\$ (2,606,836)	\$ (2,085,468)	\$ (521,368)	\$ 0	
June 30, 2017	704,309	422,586	140,862	140,861	
June 30, 2018	(681,054)	(272,422)	(136,211)	(272,421)	
June 30, 2019	(407,413)	(81,483)	(81,483)	(244,447)	
June 30, 2020	(685,847)	0	(137,169)	(548,678)	
Total	\$ (3,676,841)	\$ (2,016,787)	\$ (735,369)	\$ (924,685)	

Section 2.4: Historical Asset Rates of Return

	Actuar	Actuarial Value		ir Value	
Year Ending	Annual	Cumulative*	Annual	Cumulative*	
June 30, 2005	N/A	N/A	6.4%	6.4%	
June 30, 2006	N/A	N/A	5.2%	5.8%	
June 30, 2007	8.4%	8.4%	13.1%	8.2%	
June 30, 2008	6.4%	7.4%	(2.3)%	5.5%	
June 30, 2009	2.8%	5.8%	(9.8)%	2.2%	
June 30, 2010	3.0%	5.1%	11.8%	3.8%	
June 30, 2011	4.6%	5.0%	13.4%	5.1%	
June 30, 2012	3.4%	4.7%	0.5%	4.5%	
June 30, 2013	4.6%	4.7%	7.6%	4.8%	
June 30, 2014	8.8%	5.2%	13.4%	5.7%	
June 30, 2015	7.0%	5.4%	0.9%	5.2%	
June 30, 2016	4.2 %	5.3%	(0.2)%	4.8%	
June 30, 2017	4.8 %	5.3%	8.2%	5.0%	
June 30, 2018	5.3 %	5.3%	4.6%	5.0%	
June 30, 2019	4.1 %	5.2%	5.9%	5.1%	
June 30, 2020	5.1 %	5.2%	5.3%	5.1%	

^{*}Cumulative since FYE June 30, 2005.

Section 3: Member Data

Section 3.1: Summary of Members Included

Cens	sus Information as of June 30	2018	2020
Activ	ve Air Guard Members		
1.	Number	2,139	2,242
2.	Number Vested	364	405
3.	Average Age	34.98	35.20
4.	Average Alaska Guard Service	7.24	7.26
5.	Average Total Military Service	12.68	12.82
Activ	ve Army Guard Members		
1.	Number	1,575	1,639
2.	Number Vested	193	218
3.	Average Age	32.45	32.85
4.	Average Alaska Guard Service	6.00	6.41
5.	Average Total Military Service	10.34	10.82
Activ	ve Naval Militia Members		
1.	Number	63	53
2.	Number Vested	8	6
3.	Average Age	34.48	33.85
4.	Average Alaska Guard Service	5.44	4.34
5.	Average Total Military Service	11.86	10.28
Total	Active Members		
1.	Number	3,777	3,934
2.	Number Vested	565	629
3.	Average Age	33.92	34.20
4.	Average Alaska Guard Service	6.69	6.87
5.	Average Total Military Service	11.69	11.95
Vest	ed Terminated Members		
1.	Number	588	649
2.	Average Age	56.10	57.00
3.	Average Alaska Guard Service	13.84	13.84
4.	Average Total Military Service	24.42	24.58
Retir	ees (including QDROs)		
1.	Number	752	708
2.	Average Age	59.18	58.83
3.	Average Years Remaining	11.53	12.13

Section 3.2(a): Age and Service Distributions of Active Members – All Actives

	Total Alaska Guard Service									
Age Group	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
0-19	121	0	0	0	0	0	0	0	0	121
20-24	491	77	0	0	0	0	0	0	0	568
25-29	456	272	48	0	0	0	0	0	0	776
30-34	351	209	157	14	0	0	0	0	0	731
35-39	261	211	156	92	6	0	0	0	0	726
40-44	108	118	138	83	27	4	0	0	0	478
45-49	54	57	66	56	36	21	2	0	0	292
50-54	20	27	31	27	28	21	6	2	0	162
55-59	9	9	12	9	13	10	8	2	0	72
60-64	0	0	2	3	2	0	0	1	0	8
65-69	0	0	0	0	0	0	0	0	0	0
70-74	0	0	0	0	0	0	0	0	0	0
75+	0	0	0	0	0	0	0	0	0	0
Total	1,871	980	610	284	112	56	16	5	0	3,934

Section 3.2(b): Age and Service Distributions of Active Members – Air Actives

Total Alaska Guard Service										
Age Group	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
0-19	42	0	0	0	0	0	0	0	0	42
20-24	216	25	0	0	0	0	0	0	0	241
25-29	266	151	26	0	0	0	0	0	0	443
30-34	192	121	88	8	0	0	0	0	0	409
35-39	162	131	112	63	5	0	0	0	0	473
40-44	75	73	95	51	20	2	0	0	0	316
45-49	28	30	37	35	23	17	1	0	0	171
50-54	15	9	21	12	15	16	4	2	0	94
55-59	7	7	5	6	8	8	6	2	0	49
60-64	0	0	0	2	1	0	0	1	0	4
65-69	0	0	0	0	0	0	0	0	0	0
70-74	0	0	0	0	0	0	0	0	0	0
75+	0	0	0	0	0	0	0	0	0	0
Total	1,003	547	384	177	72	43	11	5	0	2,242

Section 3.2(c): Age and Service Distributions of Active Members – Army Actives

	Total Alaska Guard Service									
Age Group	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
0-19	79	0	0	0	0	0	0	0	0	79
20-24	264	51	0	0	0	0	0	0	0	315
25-29	184	120	22	0	0	0	0	0	0	326
30-34	148	86	67	6	0	0	0	0	0	307
35-39	97	80	44	29	1	0	0	0	0	251
40-44	31	39	42	31	7	2	0	0	0	152
45-49	25	26	27	21	13	4	1	0	0	117
50-54	4	18	10	14	12	5	2	0	0	65
55-59	2	2	7	3	5	2	2	0	0	23
60-64	0	0	2	1	1	0	0	0	0	4
65-69	0	0	0	0	0	0	0	0	0	0
70-74	0	0	0	0	0	0	0	0	0	0
75+	0	0	0	0	0	0	0	0	0	0
Total	834	422	221	105	39	13	5	0	0	1,639

Section 3.2(d): Age and Service Distributions of Active Members – Navy Actives

Total Alaska Guard Service										
Age Group	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
0-19	0	0	0	0	0	0	0	0	0	0
20-24	11	1	0	0	0	0	0	0	0	12
25-29	6	1	0	0	0	0	0	0	0	7
30-34	11	2	2	0	0	0	0	0	0	15
35-39	2	0	0	0	0	0	0	0	0	2
40-44	2	6	1	1	0	0	0	0	0	10
45-49	1	1	2	0	0	0	0	0	0	4
50-54	1	0	0	1	1	0	0	0	0	3
55-59	0	0	0	0	0	0	0	0	0	0
60-64	0	0	0	0	0	0	0	0	0	0
65-69	0	0	0	0	0	0	0	0	0	0
70-74	0	0	0	0	0	0	0	0	0	0
75+	0	0	0	0	0	0	0	0	0	0
Total	34	11	5	2	1	0	0	0	0	53

Section 3.3: Member Data Reconciliation

	Active Members	Vested Members	Benefit Recipients	Total
Total at June 30, 2018	3,777	588	752	5,117
New Entrants	902	0	0	902
Rehires	30	0	0	30
Non-vested Terminations	(549)	0	0	(549)
Vested Terminations	(108)	108	0	0
Retirements	(49)	(27)	76	0
New Survivors	0	0	0	0
New QDROs	0	0	1	1
Deaths	0	0	(8)	(8)
Data Changes/Expiration of Benefits	(69) ¹	(20) ²	(113) ³	(202)
Total at June 30, 2020	3,934	649	708	5,291

¹ Includes 69 participants who cashed out on or after June 30, 2018.

² Includes 22 participants who cashed out on or after June 30, 2018 and 2 participants who were rehired from terminated non-vested status and then terminated as vested between June 30, 2018 and June 30, 2020.

³ Includes 122 participants with an expiration of benefits, 5 additions (data corrections), and 4 participants who were rehired from terminated non-vested status and then retired between June 30, 2018 and June 30, 2020.

Section 4: Basis of the Actuarial Valuation

Section 4.1: Summary of Plan Provisions

Effective Date

January 1, 1973

Members Included

Members of the Alaska National Guard who were active on or after January 1, 1973, and members of the Alaska Naval Militia who were active on or after July 1, 1980.

Eligibility Service

Eligibility service is defined as the combined Alaska guard service, guard service in any other state, active military service and the reserves of them. A member must have 20 years of eligibility service to be vested in the National Guard and Naval Militia Retirement System.

Benefit Service

Benefit service is defined as satisfactory service in any branch of the Alaska guard. A member must have 5 years of benefit service to be vested in the National Guard and Naval Militia Retirement System. Benefit service is also used to determine the length of the member's pension retirement benefit.

Retirement

Eligibility

Members are eligible for voluntary retirement after completing 20 years of satisfactory service in the Alaska National Guard, Alaska Naval Militia or U.S. Armed Forces, and the reserve of them or any combination of that service if they have at least five years of Alaska National Guard or Naval Militia service. Credit is also allowed for Territorial Guard service rendered to the former territory of Alaska.

Members are eligible for involuntary retirement at any time assuming there has been no misconduct.

Benefit

Eligible members may elect to receive:

- a. monthly benefits of \$100 which are payable for a period equal to the number of months that they were active members;
- b. a lump sum benefit equal to the actuarial equivalent of a.; or
- c. monthly payments until age 72 equal to the actuarial equivalent of a.

Vesting

Members are 100% vested after 20 years of total service in the Alaska National Guard, Alaska Naval Militia, U.S. Armed Forces or Reserves, or any combination of that service if members have at least five years of Alaska National Guard or Naval Militia service.

Survivor's Benefits

- a. Active Members: If the member has at least five years of active service in the Alaska National Guard or Naval Militia, the designated beneficiary will receive a lump sum benefit equal to the retirement benefit.
- b. Retired or Terminated Vested Members: The designated beneficiary will receive a lump benefit equal to the remaining benefits payable.

Disability Benefits

Members are eligible to receive monthly disability benefits of \$100 (which are payable for a period equal to the number of months that they were active members) at any age if they become incapacitated and are vested in the plan.

Changes Since the Prior Valuation

There have been no changes in benefit provisions since the prior valuation.

Section 4.2: Description of Actuarial Methods and Valuation Procedures

Actuarial Method

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method (level dollar basis). Any funding surplus or unfunded accrued liability is amortized over 20 years less the average total military service of active members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date).

The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of system assets measured on the valuation date.

Under this method, differences between the actual experience and that assumed in the determination of costs and liabilities will emerge as adjustments in the unfunded actuarial accrued liability, subject to amortization.

Valuation of Assets

Effective June 30, 2006, the asset valuation method recognizes 20% of the investment gain or loss in each of the current and preceding four years. This method was phased in over five years. Assets are initialized at market value as of June 30, 2006. All assets are valued at fair market value. Assets are accounted for on an accrued basis and are taken directly from financial statements audited by KPMG LLP. Valuation assets are constrained to a range of 80% to 120% of the market value of assets.

Changes in Methods Since the Prior Valuation

There have been no changes in methods since the prior valuation.

Section 4.3: Summary of Actuarial Assumptions

Investment Return

7.00% per year, net of investment expenses.

Mortality (Pre-Commencement)

RP-2014 employee table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Mortality (Post-Commencement)

91% of male and 96% of female rates of RP-2014 healthy annuitant table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Disability Mortality

RP-2014 disabled table, benefit-weighted, rolled back to 2006, and projected with MP-2017 generational improvement.

Administrative Expenses

The expense load is equal to the average of the prior 2 years' actual administrative expenses rounded to the nearest \$1,000 as follows:

Fiscal Year Ending June 30	Amount
2019	\$ 282,338
2020	230,609
Total	\$ 512,947
	<u>÷ 2</u>
Expense Load (Rounded)	\$ 256,000

Turnover

Ultimate rates of turnover based upon the 2013-2017 actual experience. Sample rates are shown below.

Select Rate	Ultimate Rates of Turnover			
During the	After the First 5 Years			
of Emp	of Employment			
Year of Employment	Unisex Rate	Age	Male Rate	Female Rate
1	20.00%	30	11.09%	14.05%
2	10.00%	40	9.09%	11.52%
3	10.00%	50	4.89%	6.19%
4 5	10.00% 10.00%			

Disability

Incidence rates based upon the 2013-2017 actual experience of the State of Alaska Public Employees' Retirement System for the Peace Officer/Firefighter group.

Sample rates are shown below.

Age	Male Rate	Female Rate
20	0.0179%	0.0112%
25	0.0374%	0.0234%
30	0.0570%	0.0356%
35	0.0679%	0.0425%
40	0.0822%	0.0514%
45	0.1157%	0.0723%
50	0.1714%	0.1071%
55	0.2954%	0.1846%
60	0.5110%	0.3194%

Retirement

Retirement rates based upon the 2013-2017 actual experience.

Active members are assumed to retire beginning at the earliest eligible retirement age according to the following rates:

Age	Rate	Age	Rate
<51	13%	58	45%
51	13%	59	50%
52	13%	60	55%
53	15%	61	60%
54	20%	62	60%
55	25%	63	60%
56	35%	64	60%
57	40%	65+	100%

Vested Terminated members are assumed to retire at the later of current age or age 50 when electing an annuity, and at current age when electing a lump sum.

Form of Payment

70% of members are assumed to elect a lump sum benefit. 30% of members are assumed to elect a monthly annuity with the number of payments equal to the number of months they were active in the plan. A lump sum of the remaining payments is paid if the member should die while receiving payments. Lump sums are calculated based on a 7% discount rate annuity certain factor.

Imputed Data

Data changes from the prior valuation which are deemed to have an immaterial impact on liabilities and contributions are assumed to be correct in the current year's client data. Active and terminated members with a date of termination after the last date of hire are assumed to be terminated with status based on their amount of vesting service.

Changes in Assumptions Since the Prior Valuation

The amount included in the Normal Cost for administrative expenses was changed from \$242,000 at June 30, 2018 to \$256,000 at June 30, 2020.

Section 5: Actuarial Standards of Practice No. 51

Funding future retirement benefits prior to when those benefits become due involves assumptions regarding future economic and demographic experience. These assumptions are applied to calculate actuarial liabilities, current contribution requirements, and the funded status of the plans. However, to the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the plans. Understanding the risks to the funding of the plans is important.

Actuarial Standard of Practice No. 51 ("ASOP 51") requires certain disclosures of potential risks to the plan and provides useful information for intended users of actuarial reports that determine plan contributions or evaluate the adequacy of specified contribution levels to support benefit provisions.

Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

It is important to note that not all risk is negative, but all risk should be understood and accepted based on knowledge, judgement and educated decisions. Future measurements may deviate in ways that produce positive or negative financial impacts to the plan.

In the actuary's professional judgment, the following risks may reasonably be anticipated to significantly affect the pension plan's future financial condition and contribution requirements.

- Investment Risk potential that the investment return will be different than the 7.00% expected in the
 actuarial valuation
- Contribution Risk potential that the contribution actually made will be different than the actuarially determined contribution in the actuarial valuation
- Long-Term Return on Investment Risk potential that changes in long-term capital market assumptions or the plan's asset allocation will create the need to update the long-term return on investment assumption
- Longevity Risk potential that participants live longer than expected compared to the valuation mortality assumptions
- Other Demographic Risk potential that other demographic experience will be different than expected

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the plan. **This list is not all-inclusive**; it is an attempt to identify the more significant risks and how those risks might affect the results shown in this report.

Note that ASOP 51 does not require the actuary to evaluate the ability or willingness of the plan sponsor to make contributions to the plan when due, or to assess the likelihood or consequences of potential future changes in law. In addition, this valuation report is not intended to provide investment advice or to provide guidance on the management or reduction of risk.

Assessment of Risks

Investment Risk

Plan costs are very sensitive to the market return.

- Any return on assets lower than assumed will increase costs.
- The plan uses an actuarial value of assets that smooths gains and losses on market returns over a
 five-year period to help control some of the volatility in costs due to investment risk.
- Historical experience of actual returns is shown in Section 2.4 of this report. This historical experience illustrates how returns can vary over time.

Contribution Risk

There is a risk to the plan when the actual contribution amount and the actuarially determined amount differ.

- If the actual contribution is lower than the actuarially determined contribution, the plan may not be sustainable in the long term.
- Any underpayment of the contribution will increase future contribution amounts to help pay off the additional Unfunded Actuarial Accrued Liability associated with the underpayment(s).

Long-Term Return on Investment Risk

Inherent in the long-term return on investment assumption is the expectation that the current rate will be used until the last benefit payment of the plan is made. There is a risk that sustained changes in economic conditions, changes in long-term future capital market assumptions, or changes to the plan's asset allocations will necessitate an update to the long-term return on investment assumption used.

- Under a lower long-term return on investment assumption, less investment return is available to pay plan benefits. This may lead to a need for increased employer contributions.
- The liabilities will be higher at a lower assumed rate of return because future benefits will have a lower discount rate applied when calculating the present value.
- Historical experience of actual returns is shown in Section 2.4 of this report. The cumulative historical
 experience illustrates that although market returns have been above and below the assumed rate, the
 overall return during the time period was well below the 7% assumed and therefore the assumed rate,
 asset allocation, and future market expectations may need to be re-evaluated. A 1% decrease in the
 long-term return on investment assumption will increase the actuarial accrued liability by
 approximately 9%.

Longevity Risk

Plan costs will be increased as participants are expected to live longer.

- Benefits are paid over a longer lifetime when life expectancy is expected to increase. The longer duration of payments leads to higher liabilities.
- Health care has been improving, which affects the life expectancy of participants. As health care
 improves, leading to longer life expectancies, costs to the plans could increase.
- The mortality assumption for the plan mitigates this risk by assuming future improvements in mortality. However, any improvement in future mortality greater than that expected by the current mortality assumption would lead to increased costs for the plan.

Other Demographic Risk

The plan is subject to risks associated with other demographic assumptions (e.g., retirement and termination assumptions). Differences between actual and expected experience for these assumptions tend to have less impact on the overall costs of the plan. The demographic assumptions used in the valuation are re-evaluated regularly as part of the 4-year experience studies to ensure the assumptions are consistent with long-term expectations.

Historical Information

Monitoring certain information over time may help understand risks faced by the plan. Historical information is included throughout this report. Some examples are:

- Section 1.5 shows how the plan's funded status (comparison of actuarial accrued liabilities to actuarial value of assets) has changed over time.
- Section 2.4 shows the volatility of asset returns over time.

Plan Maturity Measures

There are certain measures that may aid in understanding the significant risks to the plan.

Ratio of Retired Liability to Total Liability		J	June 30, 2018		June 30, 2020	
Retiree and Benefi	ciary Accrued Liability	\$	6,094,900	\$	5,808,004	
2. Total Accrued Liab	ility	\$	21,934,014	\$	22,417,247	
3. Ratio, (1) ÷ (2)			27.8%		25.9%	

A high percentage of liability concentrated on participants in pay status indicates a mature plan (often a ratio above 60% - 65%). An increasing percentage may indicate a need for a less risky asset allocation, which may lead to a lower long-term return on asset assumption and increased costs. Higher percentages may also indicate greater investment risk as benefit payments may be greater than contributions creating an increased reliance on investment returns. This ratio should be monitored each year in the future.

Ratio of Cash Flow to Assets		FYE	June 30, 2018	FYE	June 30, 2020
1.	Contributions	\$	907,231	\$	860,686
2.	Benefit Payments		1,359,467		1,641,475
3.	Cash Flow, (1) - (2)	\$	(452,236)	\$	(780,789)
4.	Fair Value of Assets	\$	39,418,117	\$	42,095,708
5.	Ratio, (3) ÷ (4)		(1.1%)		(1.9%)

When this cash flow ratio is negative, more cash is being paid out than deposited in the trust. Negative cash flow indicates the trust needs to rely on investment returns to cover benefit payments and / or may need to invest in more liquid assets to cover the benefit payments. More liquid assets may not generate the same returns as less liquid assets, which can increase the investment risk. Currently, the low magnitude of the ratio implies there may already be enough liquid assets to cover the benefit payments, less investment return is needed to cover the shortfall, or only a small portion of assets will need to be converted to cash. Therefore, the investment risk is likely not amplified at this time. This maturity measure should be monitored in the future.

Glossary of Terms

Actuarial Accrued Liability

Total accumulated cost to fund pension benefits arising from service in all prior years.

Actuarial Cost Method

Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension plan for a group of plan members to the years of service that give rise to that cost.

Actuarial Present Value of Projected Benefits

Amount which, together with future interest, is expected to be sufficient to pay all future benefits.

Actuarial Valuation

Study of probable amounts of future pension benefits and the necessary amount of contributions to fund those benefits.

Actuary

Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.

Annual Required Contribution

Disclosure measure of annual pension cost.

GASB 67 and 68

Governmental Accounting Standards Board Statement Number 67 amends Number 25 effective for the fiscal year beginning after June 15, 2013 and defines new financial reporting requirements for public pension plans.

Governmental Accounting Standards Board Statement Number 68 amends Number 27 effective for fiscal years beginning after June 15, 2014 and defines new accounting and financial reporting requirements for employers sponsoring public pension plans

Normal Cost

That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual member or the plan as a whole.

Unfunded Actuarial Accrued Liability (UAAL)

The portion of the actuarial accrued liability not offset by plan assets.

Vested Benefits

Benefits which are unconditionally quaranteed regardless of employment status.

PUBLIC COMMENT:

The following people provided public comment on Thursday, June 17, 2021:

- 1. Randall Burns (Verbal)
- 2. Heather Evoy (Verbal)
- 3. Elaine Schroeder (Verbal)
- 4. Michael Tobin (Verbal)
- 5. Jim Simard (Written)

The following people provided public comment on Friday, June 18, 2021:

1. Jim Simard (Verbal)